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THE SUGGESTIVE HANDBOOK
OF
PRACTICAL SCHOOL METHOD

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THE SUGGESTIVE HANDBOOK
OF
PRACTICAL SCHOOL METHOD

A GUIDE TO THE SCHOOL-ROOM AND
EXAMINATION ROOM

BY

THOS. A. COX

ORGANIZING INSPECTOR AUTHOR OF "THE CLASS TEACHER'S ARITHMETIC"
"THE PUPIL'S ENGLISH GRAMMAR", ETC.

AND

R. F. MACDONALD

HEADMASTER, CHILDERIC ROAD SCHOOL, NEW CROSS
TEACHER OF METHOD, STOCKWELL P.T. SCHOOL, LONDON

EIGHTH EDITION

LONDON

BLACKIE & SON, LIMITED, 50 OLD BAILEY, E.C.
GLASGOW AND DUBLIN

1902

Published, 1896, reprinted 1897; 1898; 1900 (twice); 1901; 1902 (twice).

PREFACE.

The title indicates the aim of the book. All method must be merely "suggestive", for what is successful in the hands of one teacher under certain circumstances may not be equally so in another's hands and under different circumstances.

The methods of teaching here recommended are "practical", for they are the embodiment of experience gained in the school-room.

The book should, therefore, fulfil its purpose as a practical guide to young teachers, both in their preparations for examinations in School Management and Practical Teaching, and also in the daily routine work of the school-room.

NOTE TO THIRD EDITION.

One or two trifling errors that appeared in the earlier editions have been corrected in the third, and Circular No. 407 on Reading in Schools (December, 1897) has been added to the Appendix.

NOTE TO SIXTH EDITION.

The Sixth is an exact reprint of the Third and Fourth.

November, 1901.

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THE SUGGESTIVE HANDBOOK OF PRACTICAL SCHOOL METHOD.

CHAPTER I.—THE CHILD.

1. Teaching, a Science and Art.—It has been said that “a practical interest is an incentive to a theoretical acquaintance”. Who, more than the student teacher, requires a thorough grasp both of the theory and practice of his profession? Dr. Fitch says, “Teaching is both an art and a science. It aims at the accomplishment of a piece of work, and is therefore an art. It seeks to find out a natural basis for such rules as it employs, and is therefore a science.” (*Lectures on Teaching.*)

2. What is Education?—Education is the term used to describe the work of the teacher. What is the true character of this work is of the utmost importance. Parents are apt to think the child's education is complete when a modicum of information, which fits it for the counting-house or workshop, has been acquired. This is a very debased view of education. “All education is development and discipline of faculty by the communication of knowledge; and whether the faculty be the eye and hand, or the reason and imagination, and whether the knowledge be of nature or art, of science or literature, if the knowledge be so communicated as to evoke, and exercise, and discipline faculty, the process is rightly termed education” (*Report of the Royal Commission on Secondary Education.*)

But the true teacher, in addition to this, takes “all reasonable care to bring up the children in habits of punctuality, of good manners and language, of cleanliness and neatness, and to impress upon the children the importance of cheerful obedience to duty, of consideration and respect for others, and of honour and truthfulness in word and act” (*Code of Educa-*

tion, Art. 101 b). His aim is to develop *character*. To him education is the "art of forming men". He considers that the end of all culture is the elevation of the moral nature, as well as the development and discipline of faculty by the communication of knowledge.

3. The Child.—The familiar expression "tender years of childhood" indicates a period demanding much care and attention. The child's early environment may warp its physical and moral nature. Since "the child is father to the man", the necessity for careful early training in order to develop a good man is at once apparent.

The florist, understanding the tender nature of a bud, gives it such attention as will enable it to put forth its best in form, colour, and fragrance; less skilled treatment would spoil, if not totally destroy its suitability to the purpose for which it was grown. The same is true of the child. It possesses the germs of perfect maturity, but this cannot be attained without the watchful care of the skilled educator, conversant with its nature.

4. The Child Physically.—A sound body is conducive to a sound mind. Horace Mann says:—"In the great work of education our physical condition, if not the first step in importance, is the first in order of time. On the broad foundation of health alone can the loftiest and most enduring structures of intellect be reared."

Natural bodily activity, so characteristic of childhood, should be encouraged and stimulated; for by it the child is benefited physically and mentally. Inactivity in children is usually a sign of ill-health. All forms of exercise are welcome to the healthy child. Walking, running, jumping, skipping, vaulting, swimming, football, cricket, rounders, fives, &c., all these are pleasurable recreations invigorating both body and mind.

To ensure the complete development of the whole of the muscular system, a systematic course of physical exercises or gymnastics is strongly recommended. Such a course is now compulsory in all elementary schools. Experience shows that, as a general rule, the enthusiastic player is an equally enthusiastic student.

Certain forms of physical exercise develop the senses; the sight becomes keener and the hearing more acute.

5. The Child Intellectually.—The mind develops little by little. An observant, imaginative child soon finds means

of expressing its thoughts. It employs its mental powers to gratify its desires.

The circle of knowledge is begun in infancy. Everything with which the child comes in contact is a source of interest to him, and leads him to make childish inferences.

Perhaps the most marked mental effort of the little child is the fanciful creation of new ideas and images, whereby, not being bound by its meagre store of so-called facts, it revels in fanciful forms of its own creation. In early childhood fairy tales and other mythical treasures of the ages are a never-ending source of delight. To the child the story of Cinderella abounds in freshness, life, and reality.

Living things, as birds, butterflies, &c., are an unfailing source of pleasure. Place any living thing before the child and it moves towards it with an excited interest. It wants to touch it, to stroke it, to know more about it. The child never lived who did not worship flowers, reach out for them, desire to hold them in its hands, gaze at them, and smell them.

Watch a crowd of children upon the beach. The colours and forms of the pebbles interest them, and they never tire of building with sand. The formation of miniature brooks, rivers, lakes, islands, &c., is a never-ceasing source of delight. Moreover, a design fails to please until it has been decorated by sea-weed, stones, or flags.

Manual work is really the natural element of the child. The little girl wishes to use scissors, needle and thread, or to cook; while the boys harness each other in teams or play at soldiers. The tendency to imitate what they see others do is intensely strong.

Paint is a perfect delight to children; bright colours charm them. Give a child a piece of chalk and its fancy runs riot; people, horses, houses, sheep, trees, birds, &c., spring up in the brave confidence of childhood. In fact all modes of expression, except writing, are from the beginning spontaneously and persistently used by the child. Singing, modelling, drawing, painting, &c., are the natural modes of expressing thought.

"There is a well-marked order in the growth of intellect" (Sully).

(1) The process of attaining knowledge sets out with *Sensation*. Before anything can be known about material objects the mind must be impressed through the senses.

(2) *Sensation* is followed by *Perception*, when a child sees and recognizes an object brought under its notice.

(3) After perception comes *Representative Imagination*, by which the mind pictures, or forms an image of, what has been perceived; as when the face of an old friend is recalled, or the appearance of some historical personage is imagined.

(4) Finally comes the goal, *Thinking*, which includes *Conception*, or the formation of general notions; *Judgment*, or the combination of concepts; and *Reasoning*, or the combination of judgments.

The first great law to be recognized, underlying these stages of development, is that the faculties or functions of intellect are strengthened by exercise; and the second is that the senses which play so important a part in the organization of the intelligence must not be neglected.

6. Sight and Touch.—"Where sight is wanting touch assumes the function of the leading perceptual sense; and even in the case of those who see, touch is a most important medium of apprehending objects" (*Sully*). "Please do not touch" is a warning notice frequently seen in our museums and picture galleries; for, apparently, curiosity is not satisfied until touch has aided sight. Sight and touch are thus in a special manner channels of perception. These two senses, therefore, supply us with a wider and more varied knowledge of objects than the others.

7. Hearing.—"The sense of hearing ranks high, both as a source of pleasure and as a knowledge-giving sense" (*Sully*). The power of delicate discrimination both of quality and degree possessed by the ear makes it the channel by which much exact information is acquired, as well as a considerable amount of refined pleasure. To the ear we owe the delights of music, as well as the wide range of knowledge conveyed by that system of articulate sounds known as language.

8. Taste and Smell.—"The sensations of taste and smell are easily confused one with the other, and cannot be definitely distinguished, either in degree or quality. Hence they are of little importance as knowledge-giving senses", although they may be utilized as incentives to attention and close observation.

9. Muscular Sense.—"By this expression is meant the sum of those peculiar sensations of which we are aware when we voluntarily exercise our muscles" (*Sully*). In singing, or in moving the arm or leg, we have a sense of bodily activity. The muscular sense is important as a source of pleasure and a means of acquiring knowledge.

Sensations of strain give the child its immediate knowledge of the most characteristic property of material things, viz. resistance, viewed under its various forms of hardness, density, rigidity, &c.

Each and every one of the senses has its part to play in the first steps to knowledge. Experience has shown that the more highly the senses are developed the more keenly sensible is the child to its surroundings. Hence to cultivate the senses is to prepare the channels of knowledge, and to create the so-called "royal road to learning". It is certain that the child learns through the medium of the senses; and therefore any devices or methods which ignore this truth will fail in their purpose.

10. The Child Morally.—A very marked characteristic of childhood is its plasticity, or the readiness with which habits are formed. Probably character is moulded not so much by set lessons in morality as incidentally by precept and example. The twig may be easily trained and its direction for life determined; so may the young child. "The child: what will he become?" is a momentous question in the solving of which school training plays no inconsiderable part.

The child is very susceptible to surrounding influences. It likes to be governed, and takes pleasure in prompt obedience. It loves approbation, which may be judiciously used as an incentive to industry, producing a love of, and commendable pride in, work.

In the playground the desire to win is accompanied by an earnestness, a perseverance, and a determination to succeed, though "honour" be the sole reward.

The occasional disputes which arise evince in their perhaps somewhat boisterous settlement how deeply ingrained is the child's love of justice. Who, observing the childish quarrel, has not had reason to admire the courage with which the disputants stand up for the right? The very expressive words sometimes used on these occasions serve to prove that children, by nature, respect truthfulness in word and act. Dishonourable and underhand conduct meets with undisguised disapproval, much to the discomfort of the delinquent. And here, perhaps, humanity and human nature part company, as the child, through ignorance or want of thought, is unaware of the pain felt by the persecuted one. Fortunately the tyrant among children is the exception.

That the child should see in school life a foretaste of real

social life is important. All in the school, as in the community, have equal rights and privileges; the school is an epitome of society under a paternal government; hence the civic virtues— forbearance, justice, and obedience to authority—should be as the breath of school life, and the social graces—kindness, courtesy, &c.—should accompany them.

SUMMARY.

1. Teaching is a science and an art.
2. Education and instruction are not synonymous terms.
3. Education is the art of forming men.
4. Muscular and sense activities are early apparent. All forms of healthy exercise are welcome to a child.
5. The child's chief characteristics are (a) activity of the senses; (b) love of movement; (c) susceptibility to sympathy; (d) a tendency to imitativeness; (e) a desire for knowledge; (f) plasticity and readiness to form habits; (g) activity and strength of imagination; (h) love of approval.
6. Sensation, the first step to knowledge, is followed by perception, representative imagination, and finally by thinking, which includes conception, judgment, and reasoning.
7. The faculties are strengthened by exercise. The mind must be impressed through the senses. Sight and touch are in a special manner the channels of perception.
8. Character is moulded by precept and example. School is the place for the formation of right habits. Honour and courage distinguish the high-spirited child.

GOVERNMENT QUESTIONS.

1. What is meant by the faculty of observation? Why is it desirable to cultivate it? Give some examples of exercises calculated to strengthen this faculty (1) in a rural school, or (2) in a school situated in a large town.
2. It is said that the object of school education is not only to communicate knowledge, but to teach the learner to act and think for himself. Explain how and by what sort of lessons you can best give effect to this principle, either (a) in an infant school, or (b) in a school for elder children.
3. In teaching, ideas should precede words. Why?
4. In every lesson, what besides thought should receive special attention?
5. What benefits accrue from physical exercises in school?
6. Explain "Eyes are better than ears", as applied to study.
7. What are the ends or purposes to be attained in moral instruction?
8. What are the immediate ends of intellectual training?
9. Explain the meaning of education.
10. Why is it important to accustom children to self-control? How may this be done in school?
11. To what qualities in children should the teacher appeal in his government?

12. Why should the teacher study the temperaments of his pupils?
 13. Why is it a mistake to suppress the natural tendencies of children?
 14. What is meant by instruction? What should be its highest purpose?
 15. What is the difference between teaching and educating?
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CHAPTER II.—THE TEACHER.

I. General Qualifications.—Much has been said and written about the “born teacher”, although the descriptions are usually very vague. In the first place let us remember the true teacher educates; he is not satisfied with pouring into the child’s mind a certain amount of information, without caring whether it be assimilated or not. In this lies the difference between the *teacher* and the *instructor*—the one educates, the other retails facts.

All who aspire to the teacher’s office will do well to test their natural fitness for the work by a few pertinent questions. Do I love children? Do I sympathize with them? Do I find pleasure in doing them good? Do I do to them as I would be done by under similar conditions? Do I find my time with them irksome or pleasurable?

Such questions, and many others that will suggest themselves, if honestly answered, will determine whether the right vocation has been chosen. The importance of carefully weighing one’s natural fitness cannot be over-estimated; for on it depends not only the teacher’s happiness, but also that of many young lives. No work can be more arduous or vexatious than teaching if by temperament the teacher is out of harmony with his duties. Pause therefore on the threshold before it is too late to find more congenial employment. Besides good health, scholarship, and natural teaching ability, there must be devotion to the child and the work.

Perhaps the children of a class are as well able to judge the teacher’s fitness for his office as are those of riper years. None are more critical; none more quickly gauge a teacher’s worth than these little ones. Immediately the teacher appears before the class, a rough and ready estimate is being formed by as many minds as there are children. That first judgment is generally a correct one; and should it not be favourable, the teacher should cast about to discover wherein the failing lies, with the view to its removal ere the impression becomes indelibly stamped upon the minds of the children.

2. **The Teacher's Manner.** — "Manners make the gentleman" is as true as it is old; and the same may be said of the teacher. The child notes the manner of the teacher, and although he does not discriminate the several points, yet his estimate comprehends the parts that form the whole.

The teacher should be kind, courteous, and dignified. A rough and uncouth demeanour fails to please even the most neglected child. Too much familiarity is not appreciated, neither is "standoffishness". To successfully combine kindness, courtesy, dignity, and firmness is a difficult task for the young teacher.

An *energetic* manner delights the child fond of *doing*. Scholars are quick to discern the "time-server", who, losing interest in his work, constantly watches the clock, waiting for the time of release. Children sometimes like to be dilatory; but they respect a teacher ever ready to rouse them to active employment. The lazy teacher is always ridiculed and, perhaps, despised by the class.

An *encouraging* manner is effective in stimulating children below the average in mental activity. There can be no real encouragement when there is a want of sympathetic appreciation of the difficulties a child has to surmount. The task must at times appear stupendous to the child; but the teacher who encourages self-effort, by giving just sufficient help to enable the child to overcome the difficulty, has done a very useful piece of training.

A *patient* manner is necessary both for the comfort of the teacher and the taught. The teacher constantly "snapping" at the class, or appearing annoyed and irritated, gets returns of a similar character. In no particular is "like teacher, like class", more true to circumstance.

The teacher, then, must be kind, yet firm; energetic without being boisterous; encouraging to every attempt at self-effort; and patient in all things.

The teacher's weakness in character must, if possible, be hidden from the discerning eyes of the children. To do this is difficult; for manner is merely the outward expression of the natural temperament. An earnest, sympathetic teacher moves in an atmosphere of sympathy and earnestness, begotten of these qualities of his nature; a frivolous, careless manner indicates an unstable disposition; a boorish manner points to the absence of "an inborn grace that nothing lacked of culture or appliance".

3. The Teacher's Language.—The language used by the teacher should be marked by simplicity and clearness as well as by its grammatical correctness. To use words beyond the average understanding of the child is to speak in vain. Understand the child and see that he understands you, is as apposite here as in any other particular. Read the best literature, that your vocabulary may be extensive, rich, and varied; but never talk above the heads of your scholars.

The teacher's language should be a model of correct English, for the children copy his speech quite as readily as his manner. Parents are quick to detect provincialisms learnt from the teacher. Never use slang or vulgarisms; at the same time you need not pretend to be shocked at utterances that will bear a little careful pruning or mending. Be ready to correct patiently by example rather than by precept.

4. The Teacher's Voice.—Voice cultivation for speaking purposes is a neglected art among teachers; yet the voice is a powerful factor in riveting the attention and enabling the hearer to follow what is said, with ease and pleasure.

When the teacher's voice is clear, distinct, and well under control, there is usually no sign of flagging attention. The ring of the voice enables the listeners to detect whether you mean what you say. A sympathetic voice should be a bond of unity between teacher and taught. A querulous tone and a harsh voice never yet made friends anywhere. Avoid these if you would be considered your pupils' friend.

Not only will the voice assist the eye in sustaining discipline, but it will largely influence the speech of the children and the quality of the reading and recitation.

When teaching, spare the voice as much as possible. Do not speak too high or too low; let the tones be as natural as in ordinary conversation. Avoid shouting, whether in teaching or expostulating; it irritates the children and alienates their sympathy.

Remember that you have but one voice. Injure that and your usefulness as a teacher is seriously impaired, to say nothing of the effect on your health. Remember it is the duty of the class to *listen*, and not yours to *make* them hear. There must be reciprocity.

5. The Teacher's Knowledge.—It has often been said "knowledge is power". The skilled teacher, thoroughly acquainted with his subject, can rivet and control the attention

of his class. The teacher should know much more than he intends to teach; the knowledge of any subject should be of the broadest character. A teacher is expected to know everything; but as it is impossible to fulfil this very desirable qualification, he should nevertheless attain a thorough practical knowledge of the subjects to be taught.

It is as unwise to feign knowledge as it is to be ignorant; in the latter case it is better to acknowledge ignorance and promise to prepare the matter.

"Whatever is worth doing at all, is worth doing well"; so always allow ample time to prepare lessons in no stinted or perfunctory manner. Knowledge gives the teacher confidence in himself, and gives the class confidence in him. Keep abreast of the times, that the pupils may receive of the best. Learn with the pupils. Pupil and teacher must be learners together to make the work a success.

6. The Teacher's Eye.—A firm, steady gaze at the class speaks volumes. Eye speaks to eye in many senses when teacher and pupil look at one another. Through these "windows of the mind" the scholars should perceive in the teacher sympathetic earnestness and steadfastness of purpose.

The watchful eye prevents disorder, maintains discipline, and ensures progress; yet, while seeing all things, the teacher who possesses tact, says nothing, does nothing, and, apparently, sees none of the things to be reproved until a fitting opportunity arises for effective intervention.

7. The Teacher's Ear.—For disciplinary purposes, an ear quick to detect and discriminate sounds, and to locate the part of the class from which they arise, is of the greatest service to the teacher. But it must not be so sensitive that it is irritated by the slight noise inseparable from work. Although the teacher be sharp of hearing and ever on the alert to detect inaccuracies of utterance, it none the less behoves him to insist on the child "speaking out". Always listen attentively to the speaker, and do not interrupt in the midst of an answer or statement, because of something faulty in the facts or diction; this will discourage the pupil.

8. The Teacher's Power of Resource.—To the above qualifications must be added "common sense", said to be "God's best gift to man". Just as the children form their estimate of the teacher, so the teacher should be able to form a fair and just estimate of his pupils, and in his dealings with

them distinguish between the essential and non-essential. To know what to see and what not to see; what should be enforced and what should be allowed to slide; what may be allowed and what may not be allowed, &c., is a very necessary qualification of the teacher. The ideal teacher is wise rather than learned; a man more than a scholar. Forethought, coupled with power of resource, removes most difficulties, and helps to overcome any unexpected occurrence.

9. The Teacher's Influence.—There is nothing of greater importance than the subtle something which pervades the schoolroom, and determines the character of the school. A remarkable influence is exerted by some teachers, as is evidenced in their power of control and discipline, and in what is commonly called the "hold" that the teacher has over the scholars. There are some teachers whose very presence before a class appears to be an education in itself. If asked to define what it is—this inner motive power—language would fail to satisfy. It is of the nature of a fascination, the resultant of all the best parts in manner, language, voice, and address.

The vast importance of the teacher's influence can perhaps be better realized, if one thinks that in the schoolroom sit the men and women of the future, and that the teacher is shaping and directing the lives of the coming generation.

A teacher should be happy if he would make others happy. Moreover, he should be a pattern for children to imitate, so that they may be trained in habits of punctuality, good manners and language, cleanliness and neatness, and be impressed with the importance of cheerful obedience to duty, consideration and respect for others, and honour and truthfulness in word and act. Prof. Blackie said "No kind of sermon is so effective as the example of a good man". If this be true, then we cannot resist the truth that the teacher is the most important factor in education.

But the teacher's personality does not end in the schoolroom; it extends to the home. The parents esteem and respect him for his courtesy and sympathy, his enthusiastic and hopeful spirit, and his consideration and appreciation of any sacrifices they may make for the benefit of the school.

10. The Teacher an Educator.—The instructor says, "How can I get my class to remember these facts?" The educator says, "How can I use these facts to train the faculties of my children?"

The characteristic teacher sketched above is an educator. Children are as soft clay in the hands of such a teacher. The best teacher is one who suggests rather than dogmatizes, and inspires his pupils with the desire to teach themselves.

SUMMARY.

1. The teacher educates: the instructor retails facts.
2. Devotion to the child and the work is essential to success.
3. Children are good critics of the teacher's ability.
4. The teacher's manner should be kind, courteous, dignified, firm, energetic, encouraging, sympathetic, patient, and free from mannerisms.
5. The teacher should express himself simply, clearly, and grammatically; he should avoid provincialisms, slang, and vulgarisms.
6. The teacher's voice is a powerful factor in enlisting attention. It should be clear, distinct, sympathetic, and impressive. Avoid a querulous tone and a harsh voice.
7. Vigilance with the eye will prevent disorder, maintain discipline, and ensure progress.
8. The ear should be ever ready to detect all unnecessary noises, and to recognize imperfections in speech.
9. The well-informed teacher is respected by all. His knowledge should be full, practical, and constantly refreshed.
10. The power of control and discipline, the influence with parents and managers, and general power for good, depend upon the teacher's personality as indicated in his habits, his powerful example, his cordiality, his sympathy, his strength of will, and his love for children.
11. The teacher of resource quickly adapts himself to circumstances.
12. The real teacher suggests rather than dogmatizes, and inspires his listeners with the desire to teach themselves.

Note.—Questions on this chapter and the following are given with chapter III.

CHAPTER III.—THE CLASS.

1. Introduction.—Teachers who know the capabilities of their children, and scholars who have confidence in the skill of their teachers, soon regard each other as mutually responsible for steady progress. The amount of consideration, respect, and esteem the one has for the other will be the measure of the success of the day's duties. Lessons skilfully prepared and arranged, and carried out under the best conditions of light, ventilation, and healthy surroundings, and under happy and genial discipline, will tend to foster in the children of the class that love of order without which chaos and confusion

will reign, bringing to a standstill all possibility of advancement.

As the child is the unit of the class and requires to be understood, so the class is the unit of the school, and should present valuable opportunities for fostering the virtues of good government, which are capable of being directly and indirectly cultivated by the judicious management of the class teacher.

So many and various are the conditions affecting successful class management, that the following lines may not take count of all, but an attempt will be made to specify the most important, although not necessarily in the order of their importance.

2. Assembly.—In all the best schools it is customary for the children to assemble in the playground in classes under their respective teachers, just before school-time, for the purpose of inspection as to tidiness and cleanliness, and to secure an orderly entrance into the class-rooms.

Where this is not customary or practicable, the teacher should be in the schoolroom ready to receive and welcome the scholars with a pleasant greeting. Until all have assembled, the time can be profitably employed in cheerful conversation of a friendly character upon current topics and matters of general interest. It will be found that these *Class Chats* establish very friendly relations between teachers and pupils, and lead them to like to come early.

Pleasure should be associated with assembly: this will not be the case if directly they arrive they are set to prepare long lists of words, &c.

The opportunity may also be taken of inquiring the reasons for absence, for this is the concern of the class as much as of the teacher; and also for interesting the class in the punctual attendance of all. The opportunity for friendly intercourse here suggested is most valuable, and productive of much good.

3. Arrangement of the Class.—The shape of the class depends upon circumstances, but it must be so arranged that the teacher can see the whole of the scholars, and be seen by them. The usual arrangement is in parallel rows, in three sides of a square, or in a horse-shoe form. For some lessons, as geography, grammar, &c., the pupils may be seated compactly; for others, as writing, arithmetic, &c., a more extended order is necessary. In either case, vigilance on the part of the teacher will ensure attention. The teacher must feel himself free to change his position if necessary.

4. Light.—This is an important factor in determining the most suitable form for the class. Good light from the left, or from above to the front, is best, as there will be an absence of shadow, and therefore no straining of the eyesight. All glare should be avoided; hence southern windows are not the best. It is well to have one southern window for cheerfulness, but the main light should be the steadier and cooler light from the north. For oral lessons either left or right light is suitable.

Having provided the best conditions in regard to light, the teacher must see that the children observe the position best suited to the particular exercise. In reading, care should be taken that the heads are not bent down to the book, but the book so held that it is raised to a point some fourteen or fifteen inches from the eyes; in writing lessons the children must maintain an erect position, and sit parallel to the desk, so that curvature of the spine may be avoided. To make this possible, the light should so fall that the pupils will not desire to put their eyes down to the paper. The practice of bending the head nearly to the writing exercise, consequent upon deficient or improper lighting, is productive of much suffering and mischief to the eyes as well as to the spine. When light comes from the front in line with the eyes, it is apt to produce glare, and causes great discomfort. In artificial lighting care should be taken to equally distribute the burners, and spread the light by means of shades.

5. Ventilation and Temperature.—These two demand combined treatment, as they are so inseparably connected. Avoid draughts. It has been noticed that even in summer, when the windows have been opened to admit air, which blew upon the cheeks of the children, much face-ache ensued. The fresh air admitted should be given an upward tendency by means of one of the many devices in use for this purpose, *e.g.* Tobin's tubes, so that it may be diffused instead of descending in a draught upon the heads of the children.

A means of egress for the impure air should always be provided. It should be placed as near as possible to the ceiling. None of the means provided for ventilation should ever be obstructed, as is sometimes done by placing slates, &c., over inlets, or closing ventilators.

The best ventilation of all is provided at recess-time, when the windows on opposite sides of the room are thrown open to enable the air to be thoroughly and completely renewed.

Where open fireplaces are used there is always an exchange of air, and it would be well for every room to be provided with an open grate, even though other means of heating are employed. Closed fire-stoves centrally placed, and hot water pipes, distribute the heat pretty equally, but as the air is apt to be dry, it is well to keep an open vessel of water in the room where such modes of heating are adopted.

Perhaps another phase of this subject is too much disregarded. The breathing is not all done by the lungs; respiration takes place through the skin; hence when children are too close together this is impeded. The bodies require ventilation, and the air should be free to play about the children, a condition rendered impossible when children are huddled together. Building Rule II. of the New Code, Schedule VII., says:—

“Apart from open windows and doors, there should be provision for copious inlet of fresh air; also for outlet of foul air at the highest point of the room. . . . *The principal point in all ventilation is to prevent stagnant air.* Inlets should provide a minimum of $2\frac{1}{2}$ square inches per child, and outlets a minimum of 2 inches. Rooms should in addition be flushed with fresh air from windows about every two hours.

“A sunny aspect is especially valuable for children, and important in its effects on ventilation and health.

“A thermometer should always be kept hung in the room.”

Too much importance cannot be attached to good ventilation, as listlessness and inattention, the great obstacles to progress, are largely due to defective ventilation.

6. Duration of Lessons.—The duration of a lesson should synchronize with the duration of effective attention, which is said by Sir Edwin Chadwick, after careful investigation, to be fifteen minutes between the ages of five and seven years, twenty minutes between seven and ten years, twenty-five minutes between ten and twelve, and half an hour between twelve and eighteen.

The revised instructions to Her Majesty's Inspectors are in general accord with this dictum:

“It is essential that the length of the lesson in an infant school should not in any case exceed thirty minutes, and should be confined in most cases to twenty minutes; and that the lessons should be varied in length according to the section of the school, so that in the babies' room the actual work of the lesson should not be more than a quarter of an hour.”

The class teacher is usually not responsible for the timetable of the class; but in the event of weariness or listlessness evincing itself, he has means at his command whereby he can minimize the evil of too prolonged a study of one subject. A change of position from sitting to standing, a few minutes' drill, or the singing of a song will refresh both body and brain.

Punctuality in the changing of one lesson for another is very important, both for the success of the lessons and for training to habits of regularity and exactness. At the change some physical exercises should be given.

A lesson should not end too abruptly; the changing-time should in a measure be anticipated, so that the work may be summarized and the points clinched.

Just as necessary, too, is it that children should see the dependence of fresh lessons upon previous ones, and associate one lesson with another through some leading idea or ideas. Each lesson should not appear as an isolated unit.

As children are far more capable of sustained exertion in the early part of the day, the lessons demanding the *least* amount of mental exertion should be taken late in the session, and what are called the harder lessons should be taken first.

7. Order of the Class.—This is of paramount importance. On the proper maintenance of order depends much of the success of the teaching. We are used to the trite saying, "Prevention is better than cure"; therefore prevent disorder. To some this is a very easy matter; to others most difficult.

Children like to be doing; therefore give them plenty to do. Do not let work be set simply with the object of employing them and keeping them from mischief, but with some intellectual object in view. See that intelligent work is done, and enough of it to demand the concentrated efforts of the class. Get them to enter into the work with the same zeal and earnestness that they display in their games. Try also to arouse a feeling of real pleasure in work.

If the teacher is unsparing in his own efforts, the same energy will soon be apparent in the children. The teacher himself must be a model of quiet, systematic work. An earnest, careful, and painstaking system of working will develop in the class a public opinion in favour of industry and cheerful obedience, and so prevent all unruly conduct which would militate against real improvement.

The least sign of coming disorder will, with proper vigilance, be readily seen. The teacher must not appear to be too alert,

or he may create a feeling that he is suspicious, and this will be resented. If disliked, the teacher will never be able to depend upon order being maintained. Show confidence in the class. Let the scholars feel they are trusted. The more they are trusted the more they will feel their own responsibility for maintaining order. The class should feel that it has to mind itself. The teacher should be ever watchful, without appearing suspicious. To see, and yet appear not to see; to hear, and yet appear not to hear, is at times a very wise policy.

At the same time, do not be over-confiding. Remember the pupils are very young, and prone to give way to temptation. Whenever attention is drawn to individual shortcomings the teacher must be sure of his ground before interfering, and then must not allow the child to argue the matter. His dignity as a teacher has to be maintained; and the child should esteem him too highly to wish to argue or dispute any point. Confidence in his own discernment and management should enable him to sustain the position assumed; but at the same time it is most inadvisable to give children the impression that a teacher is arbitrary in government. Particularly does one need to be careful in this respect with elder children.

Let any infraction of good order be dealt with judicially, that is calmly, and without undue haste. If a mistake is made (and who never makes one?), then the teacher must find a way of putting himself on the best of terms with the aggrieved child, as well as with the class.

Confidence in the justness of the teacher's treatment commands order. "Be just and fear not." Above all, whilst maintaining authority, let kindness be a conspicuous feature of the teacher's rule. Not only will this prevent disorder, but it will secure the best attention of the class, and ensure respect for his wishes. As soon as the children recognize that it is best for everybody to let the work proceed quietly and orderly, it will be only a few of the erratic ones that will call for special treatment in the way of punishment.

8. Preparations for the Class Work.—All lessons need preparation, so that the work may be made interesting, and the subject be presented to the pupils in an easy and natural way.

Preparation may be twofold; the teacher should study the subject of the lesson beforehand, and prepare the necessary apparatus, before the lesson commences; and the children should receive some hints as to the nature of the lesson, so

that they may think about the subject and be prepared to profit by the teaching.

Although full notes of all lessons are not to be expected, yet it behoves the teacher to consider well the aim of the lesson, the divisions into which the matter naturally falls, and the means whereby the children are to be led to a thorough comprehension of the facts. Notes should be made on all these points. It is essential to consider the time at disposal, the average mental capacity of the class, and the previous knowledge the pupils may have of the subject.

The teacher having prepared his subject, must make sure that the apparatus required is ready at hand. Nothing is more vexatious in a school than to find, when a lesson is about to commence, children sent hither and thither to fetch this and that, to the disturbance of other classes and the loss of important time.

Preparedness on the part of teacher and pupil alike will invest the lesson with much of reality and useful interest. Specific preparations will be noted more particularly under the heads of the different subjects of instruction.

9. Work of the Class.—The procedure decided on for obtaining certain ends, commonly spoken of as method, must not be considered unalterable. The teacher must be prepared for emergencies. He must be able to adapt his methods to the mental condition of his pupils. Methods may be over-elaborated to the detriment of real progress.

The prime condition of all successful method is the sympathetic movement of the teacher's mind with the pupil's. This state of being "in touch" is a wonderful stimulus at all times, and lightens the labour to an untold degree.

The work of the lesson should proceed naturally, from the "known to the unknown", from the familiar to the unfamiliar. The child's present knowledge is the foundation on which to build by the exercise of the senses.

Let the children be active co-operators in the work, not passive spectators. Throw upon them as much as possible of active doing, so that self-effort may be stimulated and self-reliance fostered. The teacher should act chiefly as guide, co-operator, and remover of difficulties.

Objects should be shown and experiments performed whenever possible, so that habits of close observation may be acquired and correct ideas implanted by knowledge at first hand. Accurate verbal description of what is demonstrated

should always be required, so that the teachers may know the matter has been really understood.

Ideas are more important than words, for words are but labels; but requiring a child to express in words the knowledge acquired is a good test of the grasp the child has of the idea; any vagueness will be at once apparent. The ultimate test of knowledge is the power of applying it.

The senses are the "gateways of knowledge": they are the means, whenever possible, by which all knowledge should be gained. The knowledge resulting from the exercise of one sense should be tested and supplemented by the other senses.

When the objects themselves cannot be obtained, vivid descriptions and pictorial illustrations may form good substitutes, especially if the teacher cultivate the pupil's imagination, which is so strong in childhood, and is such an aid to learning. Always endeavour to present the concrete, even though the difficulty of obtaining what is wanted may appear insurmountable. This injunction applies to all lessons where illustrations are possible.

The strong and weak points of the individual child should be discovered, and the necessary steps taken to supplement deficiencies. Memory will need cultivation by means of association, revision, and repetition.

The black-board should be freely used by the teacher, and also by the scholars. On it should appear a careful summary of the chief points taught, together with the examples and illustrations used to elucidate them.

When the teacher sets a copy for imitation he should take care that it represents the best work of which he is capable. "Like teacher, like child" is true in a great measure.

10. Questioning.—So important is the art of questioning that it deserves separate treatment, although undoubtedly it is part of the work with the class. "Questions are to the teacher what tools are to the artisan." No abundance of objects and illustrations will stimulate the mind to action till questioning shows the need of exertion.

Preliminary questions enable the teacher to discover the amount of knowledge the children already possess of the subject, and to gauge the amount and character of the instruction which can profitably be imparted. Such questions aid the mind to recall past work, thereby linking the past with the present.

Teaching questions lead the children to acquire ideas by

observation, comparison, reason, or judgment. The mind is stimulated to action, and the child is led on step by step to the mastery of the subject; one fact acquired being made the stepping-stone to the next. These teaching questions are like finger-posts directing the course of the child, but requiring exertion on his part for the accomplishment of the task. They indicate the way in which the facts may be acquired and the natural order of acquiring them. Having placed the child in this favourable position, leave the rest to self-effort.

Examining questions given at the end of lessons, and occasionally at the end of a stage in the lesson, enable the teacher to test whether the facts of the lesson have been grasped. These questions, moreover, are a means of "crystallizing" the information imparted.

A skilful questioner thinks quickly, clearly, and connectedly, and arouses the same characteristics of mind in his hearers. The questions must be suited to the mental capacity of the average child, and be adapted to the present stage of knowledge. They should be asked with sufficient rapidity to maintain interest. Frame questions so that the answer desired is alone applicable. Neglect of this is a serious fault, and leads to much confusion and loss of time.

Let the questions proceed in natural sequence; and in every question asked keep in mind the ultimate aim of the lesson, so that each question is a step leading onwards to the goal. The questions must be so definite that children cannot misunderstand their nature.

Suggestive and elliptical questions should be sparingly employed. They do not stimulate the mind; but they may be occasionally used to encourage some of the duller children to try and answer. Questions requiring "Yes" or "No" for an answer are worse than useless, as they lead to guessing.

It is advisable to require answers to be given in complete sentences; for such answers are not only the best test of the child's thorough grasp of the point, but they also convey information to the class, thereby emphasizing your instruction and ensuring a repetition of facts for the benefit of the duller children, without necessitating that very undesirable and laborious practice common amongst young teachers, of repeating the answers as they are received. When this principle of answering has been adopted from the earliest lessons, it needs only an occasional approving word from the teacher to maintain and improve the habit. Children's questions should, as a rule, be

relegated to the close of the lesson. It is found to be a very useful exercise to permit scholars to ask questions, the answers to which shall be supplied by fellow-members of the class.

11. The Diary.—At the close of each session a record of the work done should be made in a book kept expressly for the purpose. This enables the teacher to estimate the advance made, provides a ready means whereby another teacher may continue the lessons in regular sequence, and permits at any time a thorough inspection of the work done. An ordinary exercise book ruled in columns, the name of the subject being placed at the head and the date at the side, is sufficient for the purpose.

Before dismissal it is well to lead the children to carry their minds back over the session, in order that they may summarize the chief points, and recognize that something has been gained by their attention to duty. Then when the materials have been carefully collected, the exercises of the day accurately dated, and slates cleaned ready for the next day, the class may be dismissed. The recollections of school duties will thus be made as pleasant as possible. In this way you will be doing your best to make school a happy place, and the work pleasurable to yourself and the children.

12. Rewards and Punishments.—Create interest in work and a pleasure in performing duty, then neither rewards or punishments, as *incentives* to exertion and right conduct, will be necessary. *Prizes* as inducements to industry or good conduct are detrimental to the moral well-being of the child. Expressions of approval of right conduct are preferable to objects representing approval. Behaviour and application to study depend on the will; therefore the will must be trained to desire the good and the right for its own sake. If the child will not love the right, then, for the sake of the other scholars, he must be taught to fear the wrong. Such selfish and wayward children must be shown that they are not to become a nuisance and a hindrance to the progress of good children. And if they are in no way disturbed in mind when the teacher shows displeasure with them, then they should be put aside from the class; for it is better that the one should lose the benefits of the lesson, rather than the harmony of the whole class should be disturbed. It is impolitic to “talk at” a wayward child; but if gentle reproof and signs of displeasure have

not had their effect, then the attention of the class should be drawn to the gravity of the conduct of the indifferent one.

Public exposure is one of the last resources; because unless the teacher exercise true tact, the lesson sought to be conveyed may be misunderstood, and the sympathies of the class, instead of being enlisted on the side of right and the teacher, may be transferred to the offending child. If it is found necessary to resort to detention after school hours, the ordeal should be made really unpleasant. The imposition should not be a light one; it should be punishment under control.

There are a few scholars for whom a little bodily chastisement is the best and only effective corrective; but due precautions should be taken in its infliction. Irregular punishments as boxing ears, thumping the back, or rapping knuckles are very harmful and injudicious; but a proper punishment, kindly yet firmly and deliberately administered without any appearance of vindictiveness, is very beneficial in correcting the evil propensities of some, and has been known to yield the best results in securing the happiness of that child in particular, and of the class in general.

The "Instructions to H.M.I." says:—

"It will be possible for you at your visits to form an estimate of the tone, the behaviour of the scholars, their cleanliness and obedience, their honesty, and especially the degree of interest they show in their work. It will not be difficult for you to judge whether the ordinary discipline is characterized by a willing obedience and is maintained without harshness and without noisy demonstration of authority, but the preservation of good order should be accompanied on the part of the scholars by self-control, founded upon a liking for the school and its work."

SUMMARY.

1. Teacher and children should have a mutual regard for one another.
2. Assemble orderly, and inspect the scholars.
3. Light from the left is best. Artificial light should be diffused to prevent shadows.
4. 54°-60° is the best working temperature.
5. Lessons should not exceed 15 to 30 minutes for infants, or 40 minutes for elder children.
6. Employment prevents disorder. Associate pleasure with work. A noisy teacher has a noisy class. Trust begets trust.
7. Thorough preparation of lessons is essential. Head notes are generally sufficient.

8. Encourage the active co-operation of the class.
9. Oral statement is a test of the grasp of the idea.
10. Real objects, vivid description, pictorial illustration, and a strong imagination are aids to learning.
11. Arrange systematically on the black-board all new work, so that it may strike the eye and aid the memory.
12. There are three kinds of questions—(1) Preliminary, (2) Teaching, (3) Examining. Answers given in complete sentences afford valuable training.
13. The child who cannot be made to love the right, must fear the wrong.

GOVERNMENT QUESTIONS.

1. Say what are the best means for rousing and sustaining the attention of a class inclined to be disorderly.
2. "The answers given by children to questions are too often confined to single words." Why should this be objected to, and what means can be adopted to encourage children to make complete statements and sentences of their own?
3. What do you consider the best way of arranging your class for oral examination work? (Illustrate by a diagram.) By what rules would you be guided as to your own mode of questioning, and what instructions would you give your class as to their style of answering?
4. Describe what appears to you to be the wisest and most effectual ways of dealing with disobedience or other misconduct (a) in an infant school, or (b) in a school for elder children.
5. For what offences do you consider "keeping in" a reasonable and effective punishment? Should such detention take place during interval, or after school hours, and why? How would you employ children so detained? What evils may result from excess in this sort of punishment?
6. Mention the chief causes of inattention or restlessness in young classes, especially indicating in each case whether the blame rests on the teacher, the pupils, or their surroundings. Indicate also what you consider the best remedies.
7. What are the best expedients you know for quickening and securing the attention of a languid or disorderly class?
8. What is the use of "learning by heart"? Name some things which ought and others which ought not to be learned by heart; and give your reasons.
9. What is meant by a collective lesson? Where would you place the children to whom you give it? How would you question them upon it so as to discover how much each child has learned from it?
10. What are the benefits of having a good playground in connection with a school? Indicate briefly the best arrangements in regard to school hours, work, and staff, for the securing of these benefits. Would you take part in the games of the children? If so, to what extent, and with what purpose? If not, give your reasons.
11. Give your opinion as to the value of rewards and punishments; and state the principle on which you think they ought to be administered.

12. *Say how you would deal with errors made by your pupils so as best to prevent their recurrence.*

13. How far is it in the power of a teacher, by other means than school lessons, to improve the habits, manners, and character of the children of a school? Mention any ways you know by which a teacher may exert useful influence in these respects.

14. On receiving new scholars in the school, what is the best way of deciding in what class to place them? Give reasons for your answer.

15. What do you consider the chief causes of truancy in a school? Indicate the means the teacher may use to avoid these causes, so far as under his control, or to counteract them when beyond it.

16. To secure prompt and willing obedience on the part of his pupils, by what rules should a teacher be guided in the giving of his orders? Give reasons for the rules you lay down.

17. What means would you take, in the ordinary management of your pupils, "to bring them up in the habits of punctuality, of good manners and language, of cleanliness and neatness"?

18. It is said to be a good principle in teaching that "we should proceed from the known to the unknown". Discuss this dictum; and show how it ought to regulate, for example, the mode of commencing a lesson on some unfamiliar object.

19. What means would you take in the ordinary management of your pupils to train them in habits (a) of consideration and respect for others, and (b) of honour and truthfulness in word and act?

20. What means would you employ if you had a school of your own, with a view to impress deeply on your scholars the duty of being kind to each other and to dumb animals?

21. Show that what is called stupidity in children may arise from faults on the part of the teacher. Name some faults.

22. Show that harshness and untruthfulness in a teacher influence the character and behaviour of children out of school.

CHAPTER IV.—NOTES OF LESSONS.

I. Previous Preparation.—Preparation is always necessary for successful teaching, whatever the lesson may be, and however familiar one may be with the subject to be taught.

Notes prepared for a lesson will consist mainly of the information to be imparted, written out in a condensed form; these are sometimes described as **Outline Notes** or **Head Notes**; but the notes of a lesson to be given, sometimes called **Full Notes**, take into account not only the matter, but the ways and means by which the information is to be imparted, so as to show the educative value of the teaching. The preparation of notes of lessons demands a considerable amount of judgment and forethought.

For ordinary lessons Head Notes are a sufficient guide to the teacher; but Full Notes should be made when teaching subjects of special difficulty, requiring more elaborate treatment. It is a useful practice for the beginner first to prepare Head Notes, then notes with an outline of the method, and afterwards Full Notes of the lesson.

Too much importance cannot be attached to this branch of the teacher's work; for besides being the compulsory question in the School Method Examination Paper, it is often regarded as the test of teaching ability. Much study and practice are essential to success. In the present chapter the general treatment of the subject is considered; in subsequent chapters specific help and guidance will be given in writing Notes on the different subjects of school instruction.

2. The Heading of the Notes.—In business a well-arranged bill-head is supposed to aid success; so in this exercise nothing is lost by a neat heading. The heading should mark distinctly the *title* of the lesson; the *class* or average age of the children for whom the lesson is proposed; the *time* at the teacher's disposal; the *aim* or purpose for which the lesson is given; and the *apparatus* required.

(1) **Title of the Lesson.**—This should be clearly written in half-text hand, so that the name of the subject may be seen at a glance.

(2) **The Class or Average Age.**—Her Majesty's Inspectors have noted "no indication of the class to be taught" as one of the defects in students' notes of lessons. In drawing up Notes it is absolutely necessary to success to consider the average ability of the class, assessing it by age, standard, or position in the school.

(3) **Time.**—The time allowed will depend partly on the subject to be taught, but mainly on the age of the children. The subject can be limited by restricting the points to be dealt with, but the period of effective attention on the part of the children cannot be extended. No lesson should in any case exceed forty minutes for senior classes, thirty minutes for junior classes, and twenty minutes for infants.

(4) **The Aim, Purpose, or Object of the Lesson.**—"What is my purpose in giving this lesson?" "At what shall I aim?" "What object shall I keep in view?" These are crucial questions, and on the answer will depend not only the matter, but also the method of the lesson.

Specifying the aim is generally a veritable stumbling-block; but practice makes perfect. Bear in mind that the purpose of education is to develop faculties, and not simply to impart information; therefore see how the lesson in hand may be made to fulfil this purpose, bearing in mind the stage of mental development reached by the children to whom the lesson is to be given.

To enter the main points of information in the aim is quite unnecessary; for, as will afterwards be seen, the headings of the different divisions of the lesson distinctly indicate this. The aim should indicate something of an ideal, and define the special character of the lesson. The aim may be either general or specific.

Examples of Aims—

(a) **Reading Lessons.**—The general aim is to teach the art of translating thoughts expressed in printed or written characters into spoken words; or to teach the intelligent appreciation of a passage. But it must be remembered that the general aim is attained only by slow degrees, and that there are defects to be removed and higher qualities of good reading to be acquired at each stage of the child's career; therefore the specific aim of the lesson may be to teach points of quality, *e.g.* the pitch of the voice, phrasing, emphasis; or to remove defects, *e.g.* incorrect enunciation of the initial and terminal consonants, impurity of vowel sounds, &c.

(b) **Writing.**—Legibility, regularity, freedom of style, and beauty are always to be aimed at; but details, such as rules for the length of certain letters, correct proportions, parallelism, modes of joining, &c., all these are aims for special lessons.

(c) **Arithmetic.**—The general aim should be to develop the reasoning faculty, to encourage habits of exactness, to train in methodical arrangement, and to prepare for business and trade transactions. The specific aim is always to teach the mastery of some particular arithmetical operation, and this is best exemplified by a typical sum.

(d) **Geography.**—The general aim is to lead children, by cultivating the habit of observation and the power of imagination, to trace the connection between cause and effect, and to awaken an interest in countries, nations, and people. The specific aim in some lessons may be to trace the causes, disadvantages, and advantages of certain phenomena.

(e) **History.**—By the exercise of the powers of judgment, comparison, and imagination, aim at character-building. The progress of the people in political and personal liberty; the love of country; nobility of personal character; the literature, manners, or customs of the age, &c., serve as examples of specific aims.

(f) **Grammar.**—The general aim of the lessons will be to exercise the thinking powers, and to give training in abstract thought. To teach that “Words showing action are called verbs”, that “An adjective is inflected when one thing is compared with another or with two or more things”; these are examples of specific aims.

(g) **Object Lessons.**—In these our aim is to cultivate the senses, to train to habits of attention, observation, and comparison, to stimulate active curiosity, and to teach to recognize form.

(h) **Elementary Science.**—The aim may be to teach how the special properties of a substance adapt it for use in the arts; the discovery through experiment of the principles underlying certain mechanical processes; or the recognition of the advantages of improvements in machinery.

The exercise of a little thought should now enable the student to state the aim of his lesson. Remember that putting down the divisions of the lesson is *not* stating the aim. The object of the morning bath is not to turn on the tap, get into the water, rub with a sponge, and dry with a towel; but to refresh the system by inducing a more vigorous circulation of the blood; therefore, when deciding what shall be the aim or purpose of a lesson, let the mind grasp the main idea running through it, and express this tersely in a sentence.

3. Apparatus or Materials required for Illustrating the Lesson.—The apparatus to be used in the course of the lesson should always be enumerated, except black-board, chalk, and duster, which must be ever at hand. The enumeration of the apparatus implies that it will be *ready* at the commencement of the lesson, for use during the lesson. When writing the notes this list should be borne in mind.

Be careful that the specimens employed are sufficiently large for the whole class to see distinctly, and that some are sufficiently numerous to place in the hands of each child. “Home-made” apparatus and illustrations prepared by yourself should be a distinguished feature.

The general form of the heading will be as follows:—

NOTES OF A LESSON

ON

(The Subject written in Text hand.)

<i>Class</i> or average age	<i>Time</i>
<i>Aim</i>	
<i>Apparatus</i>	

4. **The Body of the Notes of Lessons.**—Here must be stated in logical order the facts the teacher considers best adapted to lead up to and illustrate the aim of the lesson, together with the methods by which these facts are to be taught. In ordinary cases it is well to separate these two parts of the subject, so that the notes can be revised and amended in any particular, either by the teacher who has to give the lesson or by the person who has to criticise it. By following this arrangement the relation of method to matter will be more clearly seen. In preparing notes for very young children method largely predominates; but, as a general rule, the reverse is the case in drawing up notes for elder children. The paper should be about equally divided vertically, the left-hand column being headed **Subject Matter**, and the right hand, **Method of Teaching**.

5. **Subject Matter.**—This should be interesting and useful, adapted to the average mental capacity of the class, and to the special purpose of the lesson. Whatever is inaccurate, inappropriate, or trivial is useless. It should not be written in the form of an essay, but be divided into sections, marking the stages of progress, and indicating to some extent the distribution of the time of the lesson. The sections, when numbered and named, help to fix the steps of the lesson in the teacher's mind.

(1) Divisions of the Matter—

The heading of each section should be brief, yet descriptive. The introduction should excite interest and arouse attention. The sections should follow each other in logical sequence and exemplify the golden rule of teaching, "Proceed from the known to the unknown". Whatever is most familiar, and at the same time can be made to arouse attention and curiosity, will be a safe starting-point, provided the aim is safeguarded and the steps follow in natural order. The specimen divisions now given, are, like everything else in this chapter, but *sug-*

gestive hints, not to be slavishly followed, but to be carefully studied and adapted by the student to the needs of the special lesson in hand, so that the power of writing original notes may be acquired.

(2) Nature of the Matter—

Under each head, as we have said above, the matter should be interesting, full, and adapted to the purpose of the lesson. The statements must not be fulsome, nor, on the other hand, too abrupt. Clear, terse, and pointed sentences will best serve the purpose.

6. Method of Teaching.—The main points to be shown are the mode of introducing the subject, the use made of apparatus and illustrations both oral and pictorial, the sketches to be drawn on the black-board in order to elucidate the facts taught, the character of the questions to be asked, the completeness of the recapitulation, and the way in which the active participation of the children is to be obtained. An endeavour must be made to indicate the teacher's skill in removing difficulties, not disposing of them by the use of such magical words as *educe*, *elicit*, &c.

When treated in separate columns, the different divisions of Matter and Method should begin on corresponding lines. References can afterwards be made by employing index letters.

The method is the most important part of the notes of a lesson, and gives an opportunity for the writer to excel as a teacher. At an examination any subject may be set, and, without books for reference, although the matter may be sparse, the true teacher will show what can be done to achieve success even with a limited supply of information.

The means to be employed in imparting the new knowledge and revising the old must be fully shown, indicating the exact use made of pictures and other illustrations, the means of stimulating and sustaining interest, the way in which the attention of the children will be secured through intelligent, full, and constant employment, and the amount of mental effort likely to be aroused by the number and character of the questions.

Small sketches of any diagrams to be drawn on the black-board, should be shown in the method, as well as the use made of the black-board by the teacher and children.

(1) Divisions of the Method—

These will correspond to the divisions of matter.

(2) Nature of the Method—

For creating interest, through the training of the senses and

the developing of the intelligence, use will be made of oral description by teacher or child, inductive questioning and deductive reasoning, pictorial illustration, black-board drawing, or experiment performed by teacher or pupils, examination of specimens, &c. There should be very little *telling*.

In the succeeding pages the student should note the divisions of the lessons, the manner of stating the subject matter, and the method by which the matter is taught, stage by stage.

7. Specimens of Matter and Method.

1. READING.

MATTER.

I. The Story of the Piece.

Write here sufficient of the threads of the story to show that you have grasped them, and are able to talk about the subject without reference to the book. Also add any fresh matter obtained from outside sources.

II. The New Words and Phrases.

Write here the words or phrases that will be written or printed on the black-board; also prepared explanations, which should not be merely synonyms.

III. The Reading Practice.

Write the specially difficult words or phrases that will be given as a pattern of correct pronunciation, clear enunciation, distinct articulation, and natural grouping. Also name all special points of desirable excellence.

IV. Questions.

Write some specimens of the questions that should be asked.

METHOD.

I.

Relate the threads of the incident. Test the knowledge some members of the class may have of the subject. Refer to picture, illustrations, specimens, &c. Incite interest, to be afterwards satisfied by reading.

II.

Point to the words on the black-board or in the book. Repeat distinctly. Bring out the meaning. Use the words in sentences of the children's own construction. Lay particular stress on an exceptional word or phrase.

III.

Read a portion. Ask the meaning. Children read together, while teacher looks at them, and not at the book. Mistakes detected and corrected. Individual reading. No interruption of reader until he has finished; then children and teacher point out faults and suggest improvements.

IV.

Question on the subject-matter. Refer to any special faults or improvements. Encourage questioning by the class.

2. DICTATION.

I. Preparing the Passage.

Write the passage or words on the black-board, underlining special difficulties.

I.

Call on a child to read the passage. See the sense is understood. Point out probable difficulties. Obtain the general meaning of the words. Repeat the words very distinctly and slowly. Class write some words a few times.

MATTER.

METHOD.

II. Dictating and Writing.

Write the phrases or sentences just as they will be dictated.

II.

Children sit in good position, nearly upright, holding pen properly, and looking at teacher. Teacher stands in good position for seeing the whole class. Dictate words, phrases, or sentences once only.

III. Correcting.

(No subject-matter can be written here.)

III.

When the tone of the school is good the children may be trusted to mark their own work. A line is made through wrong letter, and the correct letter put over, when teacher spells the words. All alterations count as mistakes. State the number of mistakes at the end. Date the exercise. Teacher looks at a book or two promiscuously.

IV. Learning Corrections.

IV.

Corrected spellings to be written twice in book. Repeated to teacher or monitor.

V. Collecting Common Errors.

V.

Teacher notes commonest mistakes, and enters these in a note-book.

3. ARITHMETIC.

I. Mental Exercises.

Write easy progressive types, leading up to the example to be taught.

I.

Ask these questions and any similar ones that may be suggested. Obtain the reason for each step. Put the sum on the board. Work it, then summarize the steps.

II. Plan of Working.

Work the model sum as a specimen of style, arrangement, and clearness.

II.

Compare step by step with smaller sum worked by the child. Show the neat and convenient arrangement.

III. The Rule.

Write rule or definition.

III.

By questions, discover and name the steps. Write each on the board. Help to frame into a clear statement. Repeat and learn the rule.

IV. Applications of Examples.

Write examples to be worked.

IV.

Ask the class to make an exercise that can now be worked. Make others.

4. A RIVER.

I. The Idea of what a River is.

Water running down a sloping road or hill-side cuts out a

I.

Refer to heavy rainfall and to water coursing down the road. Inquire what

MATTER.

pathway for itself if one is not made for it. Streams down the road are fed directly by the rain, and appear to begin where the water has collected in a pool and has overflowed the ridge. There are large streams of water always running in certain channels through the country. The bottom of the channel is called the *bed*, and the sides the *banks*.

II. Why the River runs.

Water will run to the lowest point possible, and as the sea is lower than the land, the stream runs to the sea; this place is called the *mouth*. The water starts from high ground, and this is known as the *source*.

III. How Rivers are Formed.

At the source the water springs out of the ground because of the quantity that has accumulated at that point. Valleys receive drainage water, and numerous small streams go to increase the size of the receiving stream, which is called the *river*, while the other streams are called *tributaries* or *feeders*,

METHOD.

was seen. Who jumped over? Who walked through? Who saw the starting-place? Make a slope of sand on modelling board. Let water trickle from one point. Note it does not run in a straight line. Associate with crooked cutting and irregular channel. Children draw on slates and teacher on black-board a thin wavy double line thus—



Point with pencil between the lines (bed) and at each line (bank), saying together during the action—"The bed is between the banks", emphasizing *bed* and *banks*. Write this on the black-board.

II.

Mould an irregular surface. Let water fall gently from the rose of a watering-can. Children notice when the water flows and rests. Experiment shows the water runs to the lowest point. Refer to what the children have observed outside. Note the sand represents the land, and the border of the tray the sea. Associate with water running from land to sea. The sea is lower than the land. Point on slates and on board, repeating at the same time—"The beginning is in high ground, and is called the source, while the lower part in the sea is the mouth". Write on BB.—"The source is in high ground. The mouth is in the sea."



III.

Model a river basin. Pour water over. Refer to previous section on springs. Trace the streamlets into one channel. Draw on slates. Repeat "The feeders of a river are called tributaries". Explain the word as a "gift" from "tribute". Teach basin as the land drained by a river and its tributaries. Write on BB.

MATTER.**METHOD.**

Repeat and learn while pointing to drawing on the slates and BB.

IV. Uses of Rivers.

Rivers are useful for—(1) washing; (2) drinking; (3) supporting animal and vegetable life; (4) supplying food; (5) travelling purposes.

IV.

These may be obtained by questioning the children on what they have observed, by the help of pictures, or as the result of their reading. Supply information where necessary. Collect answers and write on BB. Turn the board and recapitulate the lesson to aid memory.

5. LEGISLATIVE REFORM.**I Origin or Condition leading to the Change.**

Write here a list of the abuses, evils, inconveniences, disasters, grievances, and shortcomings, either of the state or of individuals, that demanded a remedy.

I.

Refer to any desirable changes in the management of the locality; or any known grievances that call for amendment. Describe the conditions that demanded reform in the past. Draw a picture of life at the particular crisis. Read selected passage from author of repute. Write statements on BB.; then review and emphasize the same.

II. Efforts to obtain the Change.

Write a list of the evidences of discontent or dissatisfaction, such as secret conspiracies, turbulent assemblies, violent public writing and speaking, petitions to Parliament, protests of the press, resolutions in the House of Commons. Also note any prominent personages acting as leaders.

II.

Question as to known ways of ventilating grievances. Describe the unsettled conditions brought about by agitators. Show picture of turbulent scene. Explain meaning of petition to Parliament. Read any protest that may appear in the press of the day; or the resolution of a meeting. Show picture of the leaders. Make a list of efforts on the BB. Determine the effective ones.

III. The Main Provisions.

Write in a list the various important clauses in the enactment.

III.

Ask children to suggest remedies. Accept the suitable ones, but frame the language in accordance with fact and statute. Write and number on BB. Learn by heart.

MATTER.

IV. The General Results.

Write the evils and their remedies side by side, indicating how happiness and peace of mind add to the welfare of the people and the stability of the state.

METHOD.

IV.

Discover from the clauses of the measure the evils remedied. Consider the effect on the people at the time, also the result to us in the present day. Glance over the occurrences, and judge if the steps in the agitation justified themselves. Suggest the better way. Point out that we are wise after the event, and profit by experience. Recapitulate and question on the whole lesson.

6. COMPARISON OF ADJECTIVES.

1.

I. Examples showing three Degrees

1

2

3

The first is a *long* line, the second is *longer*, and the third is *longest*. When speaking of a longer line we refer to only two lines; when speaking of the *longest*, to any number more than two.

"The first is a *long* line." "The second is a *longer* line." "The third is the *longest* line." Show a *small* book, a smaller, and the *smallest*. Compare three boys out of the class as *tall*, taller, tallest. As the lesson proceeds write the sentences on the BB.

II. The Differences in Degree.

A longer line means *more* of a line. Smaller boy, *less* of a boy. *Longest*, *most* of any; *smallest*, *least* of any.

Refer to the words *long*, *longer*, and *longest*. Ask the difference in meaning. Do the same with *small*, *smaller*, *smallest*. Obtain sentences containing similar words and write them on BB.

III. The Distinguishing Names.

The first step is called positive degree; the second, comparative; the third, superlative.

III.
 — 3rd step. Explain "degree" = step.
 — 2nd step. Ask for number of things compared when "*er*" is used; when "*est*". Discover that "*er*" points out more or less; "*est*", most or least. Write the names Positive, Comparative, Superlative, and explain the force of each.

IV. The Definition.

Degree is the term employed when adjectives are inflected to show *more* or *less* of a quality, or *most* or *least*.

IV.
 By questioning, help children to describe "degree" in regard to adjectives. What part of speech is dealt with? Where is the change in the form of the word? What is such a change called? What are the changes? What does "*er*" signify? What "*est*"? Write the definition on BB. and learn.

MATTER.**V. Exercises.**

Write such sentences as—
Which is the larger map? Bring
the smallest pencil. What a fine
day!

METHOD.**V.**

Slates prepared thus—

DEGREE.

POSITIVE	COMPARATIVE	SUPERLATIVE
fine	finer	finest.
small	smaller	smallest
large	larger	largest.

Sentences will be given by the teacher
and by the class, written on BB., and
questions on degree answered orally or
on the board. Then give slate exercises.

7. COCOA-NUT PALM.**I. Description of Fruit and Tree.**

The nut is brown, and enclosed
in a thick triangular case of
stout fibre; the shell is hard and
strong, enclosing a refreshing
liquid. The tree resembles a
slender column, 60 to 100 ft.
high and 2 ft. in diameter. It
is branchless, and marked with
notches. It is crowned with a
tuft of leaves 14 to 20 ft. long.
Amid these hang the fruit in
clusters.

I.

Show a real specimen. Question the
class on its colour and form. Place
against black-board. Let a child draw
round it in chalk. Take nut away. Note
shape. Draw correct triangle.



Count three sides. Let a child handle
the case, knock it, try to scratch it. Open
the case, see thickness, and pull fibres or
stringy pieces. Discover nut inside. Pro-
ceed to examine in detail; pierce to find
milk, break to see kernel, and question
for description. Show picture of tree.
Draw a column. Compare with some
known columns, also with trunk of oak



Column.



Notches.

and pine, by means of pictures. Twice as
high as our ordinary trees. Show a piece
of palm, and the notches in a cane. Com-

MATTER.

II. Cultivation and Gathering.

In Ceylon and other tropical parts selected ripe fruit is exposed to the sun till leaves break through the shell, then it is planted. It flourishes near the sea, on coral reefs and islands. Natives climb the trees to gather the fruit, but sometimes monkeys are trained for that purpose.

III. Uses of Various Parts.

(a) The trunk is used for building-timber, posts, gutters, &c.

(b) The buds for a delicate vegetable food.

(c) The leaves afford shelter, food for elephants, thatch for huts, sails for canoes, mats, carpets, hats, bonnets, books; the midrib for oars and paddles.

(d) Juice extracted from the stem makes "toddy".

(e) Shells form drinking vessels.

(f) The nuts provide food, oil, light, and milk.

(g) The husk, fibrous material for ropes, cords, mats, &c.

METHOD.

pare leaves with feathers for form, and with width of room for length. Point on picture to clusters.

II.

Show "tropics" on the map. Describe climate and people, with picture of groves. Explain reefs. Refer to self-planting. Show the acorn just sprouting. Describe the climbing, and relate the story of the natives teasing the monkeys, who then threw the nuts at them. Revise this section by questioning.

III.

Refer to parts in turn, questioning on probable use. Show pictures, models, or draw to impress some of the uses. Write on black-board. Note how invaluable it is to the natives, as they are supplied with food, drink, clothing, furniture, &c., by this tree.

Question on the whole lesson.

8. THERMOMETER.

I. Experiments in Expansion.

Liquids expand with heat and contract with cold. The changes can be made evident in a tube of small bore, when the heat applied varies. Mercury is most sensitive; shows changes rapidly; never freezes in this country.

I.

Put some water in a Florence flask; insert through the cork a glass tube of narrow bore just far enough to enter the water and be partly filled. Put a drop of red ink to colour. Heat the water over oil-lamp or bunsen. Ask children to watch the small tube. Ask what was noticed. (*The water rose in tube.*) What had been done to the water? What happens when the liquid is heated? While questioning, the liquid is cooling. Now immerse in glass trough of cold water. Children to watch and answer questions on what they observe. Refer to previous knowledge of the subject, and

MATTER

II. Application of Principle.

An instrument for measuring changes of temperature (thermometer) is made of a glass tube of uniform small bore, and having a small bulb at one end. The air is extracted, while the bulb is filled with mercury. Immersed in freezing mixture, a point is marked and numbered, 32° or 0°; exposed to hot vapour given off by boiling water, the point reached is boiling point, and is numbered 212, 100, or 80.

III. Use and Varieties.

The thermometer indicates changes in temperature. The risings and fallings are marked off in degrees, and numbered on the tube, or more generally on the wooden or metal support of the tube. In the Fahrenheit thermometer the steps are equally divided from 32 to 212; in the Centigrade from 0 to 100; and the Réaumur from 0 to 80.

METHOD.

write on BB. while children repeat—“Liquids expand with heat, and contract with cold”. Fill a small glass vessel with mercury; insert a tube; apply hot hand or hot breath. Children again asked what they observe. Place a cold wet cloth to vessel. Children again notice a change. Try the same with water; no signs. Write on BB.—“Mercury shows changes of temperature rapidly, and never freezes in this country”.

II.

Show a glass tube of small even bore, having a bulb at one end. Heat the bulb. Ask what will happen. (*Air will expand.*) Refer to “bladder” experiment. Before cooling, immerse tube end in vessel of mercury. What is observed? (*Some mercury rises into the narrow bore.*) Why? Reverse the tube; apply heat to the whole until bulb and tube are filled with mercury or vapour of mercury, through boiling. Once more plunge open end into mercury. More mercury observed entering. Why? Before cooling seal the open end. Why? On cooling, note vacuum. Write on BB.—“Air must be excluded from the tube”. Place the tube in a pail of ice; mark height of mercury. Now insert gradually into boiling water; mark height. Write on BB.—“The fixed points are freezing and boiling points”.

III.

Question on what this instrument will now show? What advantage? Note the necessity for more points. Examine specimens of different thermometers. Observe differences. Inquire personal use, general use, trade use. Explain origin of names. Centigrade = “centum”, “gradus” = 100 steps. Fahrenheit and Réaumur names of the inventors. Recapitulate by referring to the apparatus, and the black-board work. Take the reading of the thermometer hanging in the room; also refer to any readings given in the daily paper.

N.B.—This combination of general methods, and the methods of particular lessons, is given above in the hope that by studying them the student may be led to acquire the power of writing original notes of lessons such as will display individual merit.

8. The Black-board Scheme.—The summary, is a very important part of Full Notes of lessons. It represents the chief facts to be remembered by the class, shows the teacher's estimate of the relative value of the facts taught, and the use made of black-board sketches.

In actual practice the black-board sketch is formed as the lesson proceeds; and therefore, when writing the notes of lessons, it is well to summarize section by section. The divisions of the lesson are not wanted on the black-board; what is wanted is the substance of these divisions.

To write terse sentences is better than to write single words; and to make drawings before the class is better than to have them prepared: the latter course is, however, oftentimes desirable.

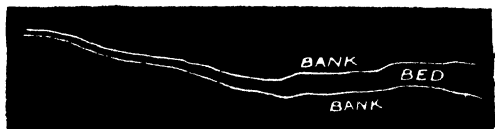
9. Specimens of Black-board Summaries:—

(1) **Reading.**—In general there would appear on the board the new words and phrases, some of which would be specially marked for accent or explanation; as well as any diagrams or sketches helping to elucidate the subject.

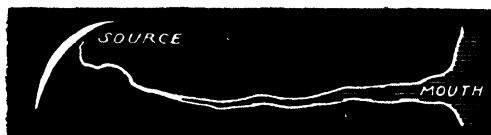
(2) **Dictation.**—The black-board would show the passage or groups of words marked for special attention, and words which caused special difficulty.

(3) **Arithmetic.**—The work of the child and of the teacher should be shown. The steps of the process and the rule would be written.

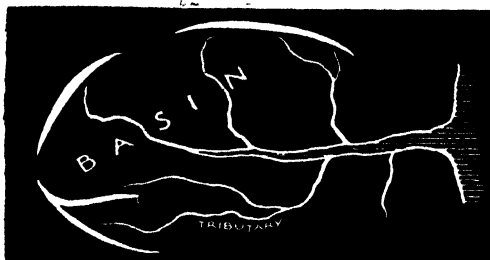
(4) **A River—**



There are two *banks*. The *bed* is between the banks.



The *source* is in high ground. The *mouth* is in the sea.



Tributaries are feeders.
(tribute = a gift.)

A *basin* is the land drained by
a river and its *tributaries*.

Rivers are useful for—

1. Washing—animals; places; things.
- 2. Drinking—refreshing draught; cooking purposes.
3. Supporting animal and vegetable life—watering; draining.
4. Supplying food—fish.
5. Travelling—boats; barges; trade.

• (5) **Legislative Reform.**—The black-board will contain a list of the points at issue, the steps in the agitation or effort, names of leaders, the clauses or enactments, and any explanations of unfamiliar terms.

(6) **Comparison of Adjectives.**—

1 2 3

The first is a *long* line. The second is a *longer* line. The third is the *longest* line.

Tom is a *short* boy. John is *shorter*. Bob is the *shortest*.

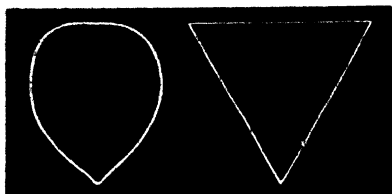
Longer = more of the line; longest = most of any.

Shorter = less of the boy; shortest = least of any.

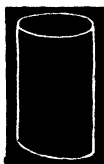
			3rd step called superlative degree.
			2nd „ „ comparative „
			1st „ „ positive „

Degree is the term used when *adjectives* are *inflected* to show more or less of a quality, or the most or least of a quality.

(7) **Cocoa-Nut Palm.**—The case is brown, hard, and fibrous.



The nut has a hard brittle shell Inside are kernel and milk.



Column



Notches.

Twice as high as our trees, but no branches. Tuft of leaves.

“The feathery palm-tree grows.” Fruit hangs in clusters.

The palm-tree grows in warm places.

The natives use the trunk for timber.

buds for food.

leaves for covering and sails.

shells for vessels.

nuts for food.

husks for mats.

(8) **Thermometer.**—Liquids expand with heat, and contract with cold.

Mercury shows changes of temperature rapidly, and never freezes in this country.

Air must be excluded from the tube.

The fixed points are the freezing and boiling points.

Thermometer is a heat measurer.

Centigrade (from L. *centum*, a hundred, and *gradus*, a step). Freezing point 0° , boiling point 100° , i.e. 100 steps.

Fahrenheit (from name of inventor—most used here). Freezing point 32° , boiling point 212° , i.e. 180 steps.

Réaumur (from name of inventor). Freezing point 0° , boiling point 80° , i.e. 80 steps.

10. Complete Form of Full Notes.—As notes of the different subjects will appear under the respective chapters, the full notes of a lesson are not given here, but the student is recommended to put together the respective sections of the types used above according to the following form:—

NOTES OF A LESSON	
ON	
Class.....	Time.....
Aim.....	
Apparatus.....	

MATTER.	METHOD AND ILLUSTRATIONS
I. Heading—	I.
II. Heading—	II.

BLACK-BOARD SUMMARY.

11. Criticism Lessons.—Before leaving this subject it will be helpful to learn the manner in which lessons may be criticised.

The lessons occurring in the usual routine of school-work may, or may not be, object lessons; but if lessons duly prepared are properly criticised by an expert for the improvement and instruction of junior teachers, they are usually designated criticism lessons. Such lessons may be criticised under the following heads:—

- (1) **The Notes of the Lesson—**
 - (a) Class time, aim, and apparatus clearly stated.
 - (b) The matter (1) as to its fulness and adaptability to the aim of the lesson;
 - (2) as to its simple and natural arrangement;
 - (3) as to its expression in a terse, clear, and pointed style.

(c) The method shown fully by exposition, experiment, or illustration.

(d) The black-board sketch.

(2) The Delivery of the Lesson—

(a) Did the instruction follow closely the prepared matter?

(b) Were the facts well known?

(c) Was the character of the questions good?

(d) Was good use made of pictures, illustrations, black-board, &c.?

(3) The Teacher during the Lesson—

(a) Was his manner kind, firm, energetic, encouraging?

(b) Was a suitable position taken up? Was attention given to all or only a few?

(c) Was the voice sympathetic, clear, and distinct? Used without undue strain?

(d) Was there sufficient enthusiasm to indicate reciprocal interest, and the association of pleasure with work?

(4) The Discipline of the Class—

(a) Were the children attentive and ready to learn?

(b) Was mental effort aroused?

(c) Did the children actively participate in the work?

(d) Was the information grasped?

A thorough acquaintance with some scheme of criticism should be of value both in the examination-room and in the class-room.

SUMMARY.

1. Outline notes answer general purposes, but full notes are often advisable.
2. The heading consists of (1) the Title, (2) the Class or Average Age, (3) the Time, (4) the Aim, (5) the Apparatus.
3. The average time varies with age from twenty to forty minutes.
4. When writing the aim let the mind grasp the main idea running through the lesson, then express this tersely in a sentence.
5. All necessary apparatus, illustrations (pictorial or objective), should be named, except those in everyday use.
6. The body of the notes of lessons consists of the subject matter of instruction, and the method of presenting the same to the class.
7. The matter should be interesting and useful; well adapted to the special purpose of the lesson, and to the average mental capacity of the class.
8. The method shows the means to be employed in imparting and revising knowledge.
9. In writing the notes matter and method may be combined, or treated in separate columns.

10. The black-board summary consists of the main points of information and of sketches that have been made to elucidate difficulties.

11. Criticism lessons are for the guidance and instruction of junior teachers.

GOVERNMENT QUESTIONS.

Write full notes of lessons on the following subjects:—

Reading.—

A.

"Our most important are our earliest years;
The mind, impressible and soft, with ease
Imbibes and copies what she hears and sees,
And through life's labyrinth holds fast the clue
That education gives her, false or true."

B.

"All the day long, in the cornfield so weary,
Father has toiled in the heat of the sun;
Now the great bell from the farmyard rings cheery,
Telling the time of his labour is done."

Arithmetic.—Rule of Three by Method of Unity. First lesson on Fractions. Simple Interest. Ratio and Proportion. Multiplication of Fractions. Short Division. Multiplication of Money. Long Division. Numeration.

Geography.—Egypt. Rivers. Tides. Mountains. Valley of the Tweed. Land and Sea Breezes. Trade Wind. The Sun. The Alps. A Cape. River Mississippi. Islands.

History.—British Navy. House of Commons. Court of Justice. The Uses of Laws. Passing an Act of Parliament. Joan of Arc. Cardinal Wolsey. Some Battle in English History. Loyalty. Patriotism.

Grammar.—Adverbs and Adverbial Phrases. Simple Analysis. Transitive and Intransitive Verbs. Cases of Pronouns. Complex Sentence. Parts of a Simple Sentence. Adjective and its Uses. Participle used as a Noun. Predicate of a Sentence. Moods of Verbs. Prepositions.

Object Lessons.—Clothing. Any Common Flower. Fruits. A Farmyard. Season of Spring. The Whale. A Flour Mill. Wool. Ambition. Penny Post. Horse. Wheat. Coal. Snow and Hail. Herring Fishery. Coal Mine. Iron. Rain. Leaves. Plough. Bread. Grass. A Candle. Fresh Air and its Uses. Birds' Feathers. A Railway. Post-office Order. Rain. A Horse Shoe. Tea-cup. Needle. Thread. Sense of Light. Pure Air.

Elementary Science.—Electric Telegraph. Manufacture of Steel. The Skin and its Functions. Animals of the Cat Kind. Forests and Forest Trees.

General Subjects.—Helplessness of Infancy. Poetry of Childhood. Selfishness. Industry. "Easy come, Easy go." Healthy Exercise. Kindness to Animals.

CHAPTER V.—PRINCIPLES OF INFANT TRAINING.

1. Necessity and Importance of Training.—The words of Froebel, "Let us live for our children", which are now the adopted motto of the kindergarten teacher, are full of significance, and express the right principle underlying infant training.

Anything young and tender, as a plant or child, demands judicious treatment in order that the best of which it is capable may be developed. Planting in a virgin soil is easier and more productive of good than eradicating first and planting afterwards. The beginning is always of the greatest importance; therefore, if schools are to be centres of real training the child should come under their influence very early in life.

In a well-ordered home the child learns love, obedience, and gentleness. The Infant School has the opportunity of continuing this training before baneful influences have affected the child. The moral nature is then more easily moulded, and impressions for good of a permanent character are made.

Busy or careless parents oftentimes check the spontaneous activities of childhood, thinking it too much trouble to answer the questions put to them on the many things that arouse childish curiosity. Others lack the power of guiding and directing the child's activities. Therefore it is well that the little ones should early be placed under the care of the teacher who can sympathize with and turn to profitable use these characteristics of childhood.

So much attention is now paid to the ventilation of classrooms that infants coming, as many do, from the impure air of overcrowded rooms, improve very materially in general health. Their delicate frames receive careful physical training whereby health is promoted. Thus the conditions are favourable to moral, mental, and physical growth.

In Junior and Senior departments to distinguish children who have benefited by a good infant school training is not a difficult matter. The child comes from the kindergarten with its faculties trained and prepared to reap the full advantage from the course of study for elder children.

2. Opportunities of Training.—(1) **Attendance.**—Parents, in many cases for the sake of the child's welfare, and in a few cases, perhaps, for their own convenience, are now

sending their little ones to school at an early age. A full three (or even four) years' attendance in an Infant School will now be the rule rather than the exception. This being so, there will be leisure to develop natural methods of instruction, and the lower classes will be relieved from a premature preparation of subjects ill-suited to their tender age.

(2) **Classes and Class-rooms.**—Large classes in a limited area are productive of evil rather than good. A class-room built for sixty should never be habitually occupied by a greater number; otherwise health, comfort, and cheerfulness may be sacrificed. It should be clean, warm, well ventilated, and well equipped.

(3) **Teachers.**—For some years it has been the custom to train teachers specially for the "most subtle, delicate, and difficult work" of infant school management. They themselves must be in full sympathy with children, or they would often find their work extremely irksome and discouraging. Training to habits of industry, good behaviour, and cheerful and prompt obedience must necessarily be slow and require much patience.

3. Principles to be recognized.—According to the Education Departmental Circular No. 322 the two leading principles to be regarded as a sound basis for the education of early childhood are:

(1) "The recognition of the child's spontaneous activity, and the stimulation of this activity in certain well-defined directions by the teacher."

(2) "The harmonious and complete development of the whole of a child's faculties."

"The teacher should pay especial regard to the love of movement, which can alone secure healthy physical conditions; to the observant use of the organs of sense, especially those of sight and touch; and to that eager desire for questioning which intelligent children exhibit. All these should be encouraged under due limitations, and should be developed simultaneously, so that each stage of development may be complete in itself."

If we would carry out these principles we must remember—

- (a) A definite aim is to be kept in view.
- (b) The child is naturally active and desires to be "doing".
- (c) Self-effort is to be stimulated, and co-operation is to animate the work.

- (d) Natural activities are to be controlled and directed into useful channels.
- (e) The faculties are to be trained for the work of life.
- (f) One faculty is not to be trained at the expense of another; but all alike must be cultivated.
- (g) A sound mind can only be found in a sound body.
- (h) First ideas are derived from sensation.
- (i) An intelligent being, not a machine, is to be developed.
- (j) A desire to question indicates a desire for knowledge.

4. Means of carrying out the principles.—Our infant schools are making rapid advance, because their organization and the methods employed have greatly improved within recent years. We have now children grouped into classes according to ability, carefully arranged time-tables, a liberal supply of suitable apparatus, specially trained teachers, and a suitable course of instruction.

(1) **Classes.**—The first consideration is to separate the Babies from the elder infants, and then to group the latter so that they may profit by the instruction provided for the different sections. Provision for alternating noisy, quiet, and collective lessons is most desirable, so that one class may not disturb the work of another.

When the rooms are furnished with convenient desks and galleries, are well warmed, lighted, and ventilated, and the classes are of reasonable size, the conditions are favourable to progress. A class of forty is a convenient size; it ought never to exceed sixty.

The classes are best distinguished as *First Class*, *Second Class*, &c., according to the state of proficiency in the different subjects, rather than by age, as "*Six year old*", &c., which was formerly the custom.

A syllabus of work should be provided for each; this should be drawn up to last a month or some other suitable period.

It is not too early to foster in the children a pride in the school and class. Each child should be encouraged to do its utmost to make the class to which it belongs the best in point of punctuality, attendance, cleanliness, and industry.

Children appreciate the care bestowed on them. A cheerful reception, regard for their comfort on coming to school in unfavourable weather, and a thoughtful supervision in the playground and cloak-room, are not thrown away.

(2) **The Time-table.**—The day's work must be characterized by diversity, shortness of lessons, and intervals for rest and

song. As a rule when weariness is found among children, it is the fault either of the time-table or of the teacher. A good time-table is a boon to the teacher as well as to the child; too much care cannot, therefore, be bestowed upon it. A lesson of 15 to 20 minutes is quite long enough, if effective attention is to be maintained. A due amount of time must be assigned to manual exercises and recreative employments. In deciding the order in which the subjects shall succeed each other, those making the *least* demand upon the mental powers should be put towards the end of the day.

(3) **Apparatus.**—There is almost an over-abundance of aids in the present day; and although an efficient and sufficient supply of apparatus is essential, the effective use of what is supplied is more important than the amount. "Home-made" apparatus has a great educational value, in that children will be impressed by what the teacher does, and try to imitate it. The care with which book, picture, or specimen is handled; the manner in which slates and black-boards are cleaned; the order and arrangement of the cupboards; the way in which maps and pictures are hung and dusted; these and similar seemingly minor matters are valuable, though silent teachers, training to habits of order and neatness.

(4) **Teachers.**—No teacher needs to be more truly an educationist than the teacher of infants; and although in a previous chapter attention has been called to the general characteristics of the true teacher, yet such a peculiar fitness is demanded for infant training, that even if we do not amplify the points we must emphasize them. The teacher who by parental character inspires confidence, banishes fear, and encourages the frankness of disposition characteristic of childhood, gains a paramount influence over the child at a time when it is most impressionable; and is enabled to foster the right and correct the wrong without undue strictness. The daily life of a good infant school is most favourable to the development of all that is good in the child, the repression of all that is evil, and the formation of habits of life-long benefit.

The teacher must, in a sense, be as a child. She must bring to the work cheerfulness and vivacity, give full play to her imagination in childish things, and take a strong delight in the unrestrained ways of children. The infants' teacher must study, understand, and love the child.

To this natural disposition must be added the pedagogic

equipment, acquired through training and study, which brings to bear upon the training of the little ones an ample knowledge of the best methods of instruction and skill in carrying them out.

(5) **Curriculum.**—Almost absolute freedom is given by the Education Department in the choice of subjects for carrying out the right principles of infant training, and special stress is laid on the fact that children are not expected to be able to pass any standard examination until the age of seven. Provision must, however, be made in the curriculum for—

- (a) Suitable instruction in elementary subjects.
- (b) Simple lessons on objects and phenomena of nature and common life.
- (c) Appropriate and varied occupations.
- (d) Needlework for boys and girls, or for girls only, with drawing for boys.
- (e) Singing by note or by ear.

(6) **Methods.**—In the past sufficient attention was not given to the principles underlying infant training; hence artificial methods were adopted that were “short cuts” to knowledge, rather than natural methods which would train the senses and exercise the reasoning powers. Now attention is given, not so much to *what* they learn at this early period, as to *how* the information is imparted; the object of the instruction being gradually to develop the whole of the faculties.

That interest is a very great motive power is now recognized; therefore, *things* in which the child is interested are presented to its notice. One by one they are studied under the guidance of the teacher in order to develop the senses and the mental power.

Circular 322 (Appendix B) issued by the Education Department is a most important document on the Instruction of Infants. Referring to suitable instruction in Elementary Subjects it says—

“It will be found that the Elementary Subjects when taught on right methods can be treated with greater variety; Reading becomes a Kindergarten lesson through pictures and word-building; Writing becomes a variety of Kindergarten drawing; elementary exercises in Number are associated with many of the Kindergarten occupations.”

It will be observed that the association of one lesson with another is the leading idea of the above paragraph, and such

association is considered the true method of training infants. This principle, called by some *correlation* or *concentration*, is expressed in the following paragraph of the Circular:—

“You should direct the attention of teachers to the chief consideration which underlies true methods of infant teaching, viz., the association of one lesson with another through some one leading idea or ideas. The reading lessons, occupations, and object lessons may all be usefully combined for one purpose, e.g., if the teacher wishes to impress on her class some knowledge of a domestic animal, she may usefully combine the object lesson for general study of its structure; the reading lesson for a knowledge of its habits and character; some occupation, such as pricking the outline, to impress an exact knowledge of its form; a song or simple story bearing on its associations with human life; so that familiarity with animals, especially with domestic animals, and a kind treatment of them may be fostered.”

This linking or associating one lesson with another must develop and sustain interest, as well as assist the memory.

We give a practical illustration of the way in which the theory is put into practice, by supplying a specimen day's lesson.

ILLUSTRATION.

BABIES. *Object*—A Cat.

- (1) A *Conversational* lesson. (2) *Letters* c a t found, recognized, and arranged in proper order to form “cat”. (3) *Recitation*—“I like little pussy”. (4) *Writing* the letters c a t or *drawing* a bed for pussy. (5) *Song*—“I like little pussy”. (6) *Occupation*—*Forming* to make a soft bed for pussy. (7) *Number*—A collar to be made for pussy by threading and counting beads. (8) *Kindergarten Game*—“Puss in Corner”. (9) *Picture Story* about cats.

UPPER DIVISION. *Object*—A Duck.

- (1) *Object Lesson* on a duck. (2) *Singing*—“How the little ducklings”. (3) *Word-building* from duck, drake, fish. (4) *Writing* the word “Feathers”, and the sentence “The duck eats fish, worms, and plants”. (5) *Arithmetic*—Exercises using the four simple rules, e.g., 6 ducks on one pond and 8 on another. How many altogether? How many more on one than on the other? What

would 3 times as many be? Separate them into two groups. (6) *Drawing* on squared paper a shelter for a nest, and afterwards colouring it. (7) *Occupation—Weaving* to illustrate nest-making; *pricking* or *embroidering* an outline. (8) *Kindergarten Game*. (9) *Reading*—"Chicks that were not chicks". (10) *Recitation*.

By such methods as these unity of thought is developed, interest maintained, and memory strengthened.

Circular 322 also calls attention to faults of some so-called Kindergarten teaching:—

"It is often found that the Kindergarten Occupations are treated as mere toys, or amusing pastimes, because they are attractive for children, and the intellectual character of the 'Gifts of Froebel' is disregarded, whereas the main object of these lessons is to stimulate intelligent individual effort."

5. Subjects of Instruction.—In the curriculum must be found—

A. Reading, Writing, and Number.—These, which will be dealt with separately in later chapters, are certainly essential subjects of instruction; but they are found to make most progress when associated with more interesting subjects. Although the little ones should learn to read, to write, and make simple calculations, these exercises need not necessarily form isolated lessons. The scholars in the lower classes may be relieved of the premature preparation of such subjects, since they have not to show any marked proficiency in them till the age of seven.

Interest will be aroused in *reading* if the sentences to be read are those formed by the children themselves during the object or other oral lesson. In the Upper Division let simple statements printed on the black-board during the object lesson be used for the reading lesson. Such lessons, if *kektographed*, will serve for revision and future reading. The observations made on examining a picture may be similarly treated. Selected lessons from books about children's pets, games, and home-life may be usefully employed to foster a desire to read.

In *writing*, a word, phrase, or sentence of the foregoing reading matter may form the copy, and thus interest will be aroused in what is really a mechanical exercise. In the Babies' Class a simple drawing of some object mentioned may be substituted for the writing exercise.

In *number* lessons it is well to introduce early the whole of the four simple rules, applying them specially to the objects which have recently been under consideration. The difficulty of the exercise will of course be increased as the children advance in intelligence.

B. Object Lessons.—The general treatment of these lessons is discussed in the next chapter; the practical suggestions here made will, therefore, have reference to their applicability as a means of infant training.

Conversational methods should be chiefly employed, and an earnest endeavour made to maintain a connecting link between the lessons.

Out of the abundance of subjects which nature-study provides, the difficulty is to make a wise selection of simple lessons on subjects and phenomena of nature and common life which shall be both systematic and well graduated.

The practice of advancing children from class to class as intelligence develops, even during the course of the year, is characteristic of the best schools. The necessity, therefore, of maintaining continuity in the subjects chosen, so that a child thus advanced may not be wholly ignorant of its new lessons, is at once apparent. For example, a lesson on "The Cat" in the lowest class will be followed by a fuller lesson on the same subject in the middle division, and by a comparison of the cat with other members of the cat tribe, *e.g.*, the tiger, in the upper division. A suggestive scheme (Scheme B, p. 55) is drawn up on this principle.

Another mark of a good scheme is that the lessons are capable of being enforced and illustrated by some suitable occupation. The lesson on "The Cat" may be followed by a "*Picture Story*" in the lowest division; *pricking* or *embroidering* the outline in wool in the middle division; *stencilling* a tiger, or *drawing over a prepared outline*, afterwards colouring the drawing, in the upper division.

The circumstances of the children and the school must be borne in mind in selecting the list of objects, so that we may be sure the object chosen is able to be obtained for direct investigation, thus making the lessons actual studies of nature.

The scheme must be sufficiently elastic to allow the lessons to be given at the proper period of the year in which they may be most appropriately studied, *e.g.*, flowers in summer, fruits in autumn, snow in winter, &c. Such a scheme is provided by Scheme A below.

Another idea is sometimes taken as the basis of a scheme. Some one central subject is chosen, and a course of lessons drawn up all springing from this object. Scheme C is based on this principle.

SPECIMEN SCHEMES.—SCHEME A.

<i>Lowest Division.</i>	<i>Middle Division.</i>	<i>Upper Division.</i>
1. The cat—uses and habits.	1. Cat—adaptability of structure to use.	1. Dog and cat compared and contrasted.
2. Different kinds of dogs and their use.	2. Domestic animals.	2. Horse and donkey compared and contrasted.
3. Pet animals.	3. Rabbits.	3. Kindness to animals.
4. Bird and nest.	4. General characteristics of birds.	4. Birds and fish contrasted.
5. A canary.	5. A sparrow.	5. Comparison of canary and sparrow.
6. Eggs of different kinds.	6. A hen's egg.	6. How to boil an egg.
7. Spring flowers.	7. Different kinds of seeds.	7. Planting seeds.
8. Summer.	8. The sun.	8. A park or garden.
9. Farm and farmyard.	9. Work on a farm.	9. Corn.
10. Autumn fruits.	10. Winter.	10. Bulbs.
11. Articles used for food.	11. A butcher's shop.	11. The baker.
12. Articles used for clothing.	12. Wool.	12. The tailor.
13. Articles used for furniture.	13. A chair.	13. Carpenter's shop.
14. Articles used for warming and lighting.	14. Fuel.	14. Laying and lighting a fire.
15. Dressing a doll.	15. Washing dolly's clothes.	15. Toy-makers.
16. The tea-table.	16. Laying the tea-table.	16. Washing-up.
17. A cup and saucer.	17. A tumbler.	17. Potter's work.
18. A bed.	18. Rest of animals.	18. Bed-making.
19. Iron kettle.	19. Iron-mining.	19. Ironmonger's shop.
20. Earthenware goods.	20. Tinned goods.	20. A dinner table.
21. The sky.	21. Clouds and rain.	21. Fog.
22. Frost and snow.	22. Wind.	22. Ventilation.

SCHEME B, BASED ON CONTINUITY AND CONNECTION.

(1.) GENERAL CHARACTER OF SUCH SCHEME.—(a) **Lowest Class.**—Conversational lesson on a selected subject. In *language*, there would be careful practice in oral expression: in *drawing*, the use of the chequered slates when the side of a square, upright or horizontal, would impress direction of any form: in *number*,

applied calculations up to 5: in *modelling*, the laying of sticks to represent form, the pressing of ravellings: in *form*, the observation of lines, long and short, lying down and upright, curved and ball-like: in *colour*, the matching of primary colours in paper, beads, or ravellings: in *music*, an applicable action song: in *games*, a selection from the Kindergarten series: in *occupations*, threading, fraying, stick-laying.

(b) **Middle Class.**—The same subject with simple qualities, characteristics, or uses. In *language*, there would be word-making and reading from the black-board or charts: in *drawing*, the use of chequered slates with lines drawn in any direction which when connected would impress form or number: in *number*, applied calculations up to 10: in *modelling*, the making of forms by paper-folding or sticks and peas: in *form*, the discovery of forms allied to the square, oblong, cube, &c.: in *colour*, the matching of secondary and imitation primary in chalks: in *writing*, the letters of words used: in *music*, an applicable action song: in *games*, the suggestions of habits, &c.: in *occupations*, paper-folding, building (Gift iii.), mat-plaiting, pricking the outline, and drawing.

(c) **Upper Class.**—Comparison with order or tribe or adaptation of structure, &c., to uses. In *language*, there would be reading from black-board, and appropriate lessons from books: in *drawing*, the use of chequered slates for straight-lined and curved objects: in *number*, applied calculations up to 20: in *modelling*, making the thing by sticks, paper and strips, or clay: in *form*, the recognition of geometrical and curvilinear forms: in *colour*, the distinguishing of lighter and darker shades: in *writing*, copying from the black-board a sentence or two: in *music*, a song not necessarily an action song: in *games*, such as demand more endurance: in *occupations*, paper-folding, mat-plaiting, drawing, modelling, embroidering, colouring any forms suggested in the lessons.

(2.) **TREATMENT OF SPECIAL SUBJECT.**—(a) **Lowest Division—Conversational Lesson on "A Cat".**—Dealing with eyes, tongue, pads, claws, teeth, fur, whiskers, tail, &c.; noting and describing. In *language*, there would be the formation and repetition of correct sentences as "Puss has four paws", together with rhymes, &c.: in *drawing*, a line down the side of one square may be *one* leg, along the top of *two* squares the tail: in *number*, the recognition of groups as two eyes—four legs, how many pairs of legs? Two cats, how many legs? In

modelling, sticks may be placed for the bed, and some ~~ravellings~~ *ravellings* collected to form a soft bed: in *form*, notice the lying-along body, the up-and-down legs, the curled tail, the changes in form when standing, sitting, &c.: in *colour*, the selecting of beads to make a collar for puss: in *music*, the singing of "I love little pussy": in *games*, playing with a ball: in *occupations*, fraying to make a bed, threading to make a collar, stick-laying for number, and drawing for form and number. •

(b) **Middle Division—Habits and Uses.**—Sleeping, feeding, purring, capturing prey, climbing, &c. In *language*, reading words as PUSS PURRS, and recitations: in *drawing*, one square for the bed, and five squares one above the other for the tree puss climbs: in *number*, if puss sleeps 12 hours, how long is he awake out of 20 hours? If puss jumps 6 ft., how far would 3 jumps be? In *modelling*, plaiting a mat and make sleeping basket: in *form*, the changing forms when sleeping, springing, climbing: in *colour*, the choosing of colours for a bed or crayon colouring a drawing of the form: in *writing*, such words as *puss purrs*: in *music*, an appropriate song and stepwise work on the modulator: in *games*, some appropriate Kindergarten game or playing shop, buying and selling milk: in *occupations*, paper-folding to make a bed, mat for a rug on which puss sleeps, pricking the outline, drawing over prepared outline.

(c) **Upper Division—Comparison with Tiger.**—Form, colour, head, mouth, teeth, paws, manner of capturing prey, &c. In *language*, there would be reading from the black-board and books; also reading from the "graphed" summaries when a collection has been thus made; appropriate recitations would follow: in *drawing*, any geometrical forms suggested in comparing parts, as lying-down oblong for body, upright oblong for legs, &c.: in *number*, all four rules up to 20, as, If two tigers' skins make one rug, how many rugs would 10 make? If a tiger measures 5 ft., how many feet would 4 tigers measure? 4 cats and 3 tigers, how many legs? In *modelling*, roll cylinders for body, tail, legs; ball for head: in *form*, observe and express orally comparison of sizes, lengths, breadths, thicknesses: in *colour*, embroidery of outline in wool, crayon shading: in *writing*, sentences from black-board as "The head is large, and the eyes are fierce": in *music*, appropriate songs: in *games*, The showman at the Zoo: in *occupations*, modelling in clay any parts, coloured wool for outline, drawing and shading parts with crayons.

LIST OF LESSONS.

<i>Lowest Division.</i> The Subject.	<i>Middle Division.</i> The Subject Expanded.	<i>Upper Division.</i> The Subject Expanded.
1. A cat	Habits and uses ...	Comparison with tiger.
2. A dog	" " and kinds	" " wolf.
3. A horse	" " and treatment	Contrast donkey.
4. A cow	" " ...	Butter-making.
5. A sheep	" " ...	Wool and woollen clothes.
6. A bee	" " and industry	Hive and honey.
7. A frog	" " ...	Comparison with reptiles.
8. Fish	" " ...	Adaptation of structure.
9. A hen	" " of birds	" "
10. Silkworm	" of caterpillars ...	Insects.
11. Loaf of bread ...	Seeds or grains ...	Windmill.
12. Grass	Haymaking ...	Straw-plaiting.
13. Daisy	Parts of a plant ...	Parts of a flower.
14. Summer flowers	Gardening ...	Home decorations (floral).
15. Autumn fruits ...	Oranges ...	Comparison of apples and oranges.
16. Sugar	Sugar production, &c. ...	Chat on negroes.
17. Tea and coffee ...	Beverages ...	Chat on Chinese.
18. Cotton and linen goods	Cotton tree ...	Comparison of cotton and flax.
19. A book	Paper qualities, &c. ...	Paper-making.
20. Chat on trees ...	Chat on foreign trees ...	Tree productions.
21. Iron articles ...	Ironmonger's shop ...	Iron and steel.
22. Coal as fuel ...	Coal and coal-mining ...	Coal gas.
23. A school slate ...	Properties of slate ...	Quarrying.
24. Lump of salt ...	" salt ...	Salt-mine.
25. A brick	Plastic substances ...	Filters.
26. A flower-pot ...	Mould and gravel ...	Road-making.
27. Glass and water ...	Uses of water ...	Glass-blowing.
28. Shower of rain ...	Uses of rain ...	Clouds and springs.
29. A spring morning	Spring flowers ...	The seasons.
30. Ice and snow ...	Properties and uses ...	Icy regions.
31. A windy morning	Wind ...	Sails and ships.
32. A storm	A sailor's voyage ...	Thunder and lightning.

SCHEME C, WORKING ROUND A GIVEN CENTRE.

Lessons in Section (1) are suggested directly by the objects; while Section (2) is suggested by Section (1); and the lessons in Section (3) by Sections (1) and (2).

Bird and Bird-cage.—(1) **Lowest Division.**—Conversational lessons on—

- (a) *Animal World.* A canary, form, plumage, and song. Parts of a bird, 2 eyes, 2 wings, 2 legs, a body, a head, a tail, a beak, covering of feathers. A sparrow, seen daily. A hen, kept for food. An egg, shell and yolk,

- food, hatching. *Voices of birds*, singing, growing, cackling, chirping.
- (b) *Plant World*. *Wood*, common everywhere. *Timber trees*, cut down and sawn. *Parts of a plant*, the groundsel or grass for illustration. *Seeds*, for food. *Berries*, food on bushes. *Grass*, for play.
- (c) *Mineral World*. *Metals*, harder than wood. *Iron*, common everywhere. *Coal*, for warmth. *Wire*, drawn in lines. *Brass*, bright polish. *Sand*, cleanliness.
- (d) *Employment*. *Carpenter's shop*, wood and tools, making. *Blacksmith's shop*, iron heating, shaping. *Coal merchant*, supplying fuel. *Corn chandler*, seeds, hay. *Hen-keeping*, food, cleanliness. *Hay-making*, country life or picture.
- (e) *Phenomena*. *Cold and heat*, care of bird. *Air and light*, shade for bird. *Winter*, crumbs. *Spring*, nest building. *Autumn*, flight away. *Summer*, gardens.

The above 30 lessons connected with—

- (f) *Form study*, when examining the whole or parts, making with sticks, threaded beads, or soft material; and with
- (g) *Colour*, when using coloured sticks, or papers, and beads as suggested by painting of cage or plumage of bird, &c.
- (2) **Middle Division**.—Conversational lessons on—
- (a) *Animal World*. *Habits*, cleanliness and activity. *Movements*, walking, hopping, flying, swimming. *Food*, seeds, insects, worms, berries. *Homes*, nests in various places. *Wings and feathers*, strong outspread feathers, smooth surface, overlapping. *Beaks and claws*, showing nature of food, strength, and method of locomotion.
- (b) *Vegetable World*. *Kinds of wood*, rough, smooth, thick, thin, hard, soft, cheap, dear; colour. *The oak*, beauty of form, spreading, acorns. *Leaves*, shapes, beauty. *Flowers*, familiar names, scent. *Fruit*, favourites. *Food plants*, dinner, tea, breakfast-table.
- (c) *Mineral World*. *Tools*, common kinds. *A hammer*, gives power. *Mines*, treasures beneath surface. *Some things that can be drawn into lengths* as width decreases. *Alloys*, mix metals for wear and tear. *Glass*, mixed substances.
- (d) *Employments*. *Ironmonger*, domestic articles. *House-building*, use of timber and stone. *Smelting*, melt lead. *Bell-hanger*, wire connections. *Tinker*, repairing with solder. *Glass-blower*, water bowl, windows.

- (e) *Phenomena.* *Rain*, supply of water. *Sky*, changes marked. *Clouds*, lines, piles. *Wind*, draught. *Sun*, source of light and heat. *Moon*, changes.
- (f) *Form.* Pricking any forms suggested in the lessons, as leaves, flowers, fruit, wings, birds, cage, &c. Making with clay.
- (g) *Colour.* Outline colouring over prepared lines, or filling in prepared outline with crayons, use of coloured wool.
-
- (3) **Upper Division—**
- (a) *Animal Kingdom.* *Canary and sparrow*, compare plumage and song and habits. *Wading birds*, length and characters of legs. *Birds of prey*, scavengers. *Poultry*, rearing. *Ostrich farm*, compare with hen-keeping. *Structure*, hollow bones, light and carefully arranged clothing.
- (b) *Plant Kingdom.* *Foreign trees*, yielding fruits and woods. *The palm*, cocoa-nuts and dates. *Coffee plant*, ripened berries. *Tea plant*, dried leaves. *Cotton plant*, contents of the pod. *Nests*, industry and family care.
- (c) *Mineral Kingdom.* *Iron and steel*, qualities adapted to uses. *A plough*, labour-saving machine. *Fuel*, kinds of warmth, cooking, working. *Some things will spread out*, hammer lead. *Gold*, precious metal. *Filters*, pure water.
- (d) *Employments.* *Cutler*, steel edges. *Farmer*, country life. *Grocer*, things from foreign parts. *Plumber*, household needs. *Cotton-spinner*, sewing cotton, calico. *Straw-plaiting*, hats, baskets.
- (e) *Phenomena.* *Water*, necessity for cleansing, cooking, drinking. *Frost and snow*, frost breaks ground, snow shields roots. *Rainbow*, seen opposite to sun. *Storms*, destruction. *Day and night*, work and rest. *Stars*, wondrous beauty.
- (f) *Form.* Drawn on squared paper. Drawing over faint outline. Modelling an egg, a nest, a bird, &c.
- (g) *Colour.* Bird colouring from stuffed specimens, or colouring objects with crayons.
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SCHEME D, BASED ON THE SEASONS.

(1) *Season of Spring.* The sun shining, the birds singing, the insects humming, the flowers blooming, all suggest lessons on phenomena and animal and vegetable kingdom; while agricultural employments suggest the mineral kingdom. The sky. The clouds. The shower. The cuckoo. The swallow.

A bird's nest. Bees. The house fly. The violet. The crocus. The primrose. The daffodil. The frog. The bat. The dormouse. The plough. Garden tools. Iron.

(2) *Season of Summer.* The sun. A thunder-storm. Sheep. Sheep-shearing. Moulting of birds. Swimming. Geranium. Roses. Garden flowers. Window flowers. Wild flowers. Peas. Beans. Hay-making. Harvest. Strawberry. Berries.

(3) *Season of Autumn.* Winds. Storms. Partridge. Dogs. Hunting. Bread. Threshing. Potato. Leaves. Nuts. Apples. Acorn. Pigs. Trees. Flight of birds. Garden work. Rainbow.

(4) *Season of Winter.* Frost. Snow-storm. Fogs. Indoor pets. Indoor occupations. Fire. Coal. Candle. Evergreens. Holly. Christmas pudding. Raisins. Orange. Moon. Animals that sleep in winter. Kindness to animals.

C. Appropriate and Varied Occupations.—"It is often found that the Kindergarten occupations are treated as mere toys, or amusing pastimes, because they are attractive for children, and the intellectual character of the 'Gifts of Froebel' is disregarded, whereas the main object of these lessons is to stimulate intelligent individual effort" (Circular 322).

"It is one of the chief objects of the Kindergarten to establish a right and harmonious relation between those lessons which are addressed to the memory and the understanding of a child, and those interesting manual and other exercises which call forth his active and observant powers" (Instructions to H.M.I.).

These manual and other employments will relieve younger children, especially during the afternoon, from the strain of ordinary lessons, and train them to observe and imitate.

The objects to be borne in mind are training in—

(a) Accuracy of hand and eye, (b) intelligence, (c) obedience.

In Circular 322 of the Education Department lists are given of the employments which best satisfy these requirements, and they are in the main as follow:—

I. What Children between the Ages of 3 and 5 can do.—

1. *Games with music*, aiming at rhythmic movement, and giving happy, healthy exercise. Pleasing sounds are preferable to noise.

2. *Games without music*, stimulating thought, arousing curiosity, and exercising the senses. Such lessons may be—guessing a person, an object, a place; finding a hidden article,

the position being indicated by sound; naming a thing by touch when eyes are closed, or a flower by smell.

3. *Recitations* in order to cultivate imagination, to exercise the moral judgment by expressing approval or disapproval, and to give opportunities for conversation by nursery rhymes, fairy tales, short poems, and stories.

4. *Picture lessons*, training the observing powers by the directing questions of the teacher, and the conversational powers by teaching to frame the answers in complete sentences.

5. *Paper folding*, which teaches accuracy of hand and eye by folding precisely and neatly.

6. *Mosaic with coloured tablets*, to cultivate love of beauty and order, and exercise inventive powers by forming patterns at first under direction. Strict obedience and exact imitation are absolutely essential to success.

7. *Drawing*, to train observation and discipline the eye to quickness of perception, the hand to delicacy of touch, and to cultivate the habit of working together.

8. *Matching colours*, to exercise the powers of observation and association by picking out similar colours from a varied collection.

9. *Plaiting paper*, thereby making the fingers nimble, and teaching counting and the use of words when plaiting *one strip under, two strips over*, &c.

10. *Working patterns with needle and worsted*, exercising the constructive faculty, and impressing form as an aid to memory by working on teacher's prepared patterns.

11. *Threading beads* in twos and threes, for teaching number and colour by exercise in counting and selecting.

12. *Arranging shells* in twos, threes, &c., for teaching love of order, and number by concrete examples.

13. *Arranging pictures of number with cubes*, for awakening intelligence and forming the judgment by estimating quantity.

14. *Word-building*, to train the eyes and ears to recognize the sound and value of letters, the distinction between long and short vowel sounds, and hard and soft letters, and the voice to articulate after due exercise of observation and imitation.

II. What Children between the Ages of 5 and 7 can do.—
The above list is increased by—

1. *Object lessons*, calling into activity observation, and the construction of clear mental pictures by simplicity of treatment, suitability and variety of the illustrations, and by association with things of everyday life.

2. *Story lessons*, which present opportunities for conversation when free scope is given to imagination and speech. Natural objects, stories from history, *Grimm's Household Tales*, all provide subject matter, and also a means for exercising the judgment.

3. *Mosaic with coloured paper*, which has a gummed back for clean and easy fixing to cardboard. This exercise cultivates a love of the beautiful in form and colour by inventing and constructing patterns; it also requires care and deftness of hand.

4. *Drawing, Brush-drawing*. Aiming at freedom and boldness in executing forms, and encouraging drawing directly from the object rather than from models or copies.

5. *Ruling simple geometrical forms*. To teach useful, artistic, and mathematical forms by neat and accurate ruling.

6. *Measuring and estimating length*. Training the judgment, and cultivating exactness and accuracy. This exercise forms not only a ground-work for number, but also for applied calculations.

7. *Weighing and estimating weight*. Aiming at a preparation for arithmetic, and exercising the judgment by actual acquaintance with things.

8. *Setting the table*. To cultivate accurate observation and love of order in ordinary details, as well as neatness and care by carrying a glass of water without spilling it, moving cups without breaking. Further instruction in position as a preliminary to geography.

9. *Modelling in clay*. To exercise the inventive and constructive faculties by making copies of objects in nature, *e.g.*, an egg, an apple, &c.

10. *Basket work*. Training the hand to execute neatly by weaving straws or rushes into useful forms.

11. *Cutting out patterns and shapes with scissors*. To train the hand to work with precision and neatness by devising and constructing designs in coloured paper.

These lists by no means exhaust the occupations that have been or will be invented, nor is it expected that all will be taught. Perhaps in some schools two schemes may be adopted such as:—

Younger Infants—

- (a) Devising, building, and constructing pleasing and symmetrical figures with cubes, coloured cardboard, &c.

- (b) Forming letters in sand, with coloured cards, &c.
- (c) Drawing with the aid of sticks.
- (d) Plaiting.

Elder Infants—

- (a) Constructions with peas and sticks.
- (b) Plaiting paper.
- (c) Drawing.
- (d) Modelling. •

Froebel's Gifts.—A special feature of the Kindergarten system is a set of models called "Gifts". It is usual to specify them by numbers.

GIFT I. consists of 6 worsted balls of rainbow colours. When properly used, the aim is to teach colour and direction.

GIFT II. consists of a sphere, a cylinder, and a cone. These regular forms are meant to teach the comparison and contrast of similar and dissimilar forms.

GIFT III. is a cube divided into 8 smaller ones, with which can be built up useful, artistic, and mathematical forms.

GIFT IV. is a cube divided into 8 oblong prisms. Thus again construction and number can be taught.

GIFT V. is a cube divided into smaller, half, and quarter cubes. Forms requiring angles, triangles, &c., are built, while number and language are taught.

GIFT VI. is a cube divided into blocks, enabling a further advance to be made in construction, form, and number.

There are many others, for information with respect to which a special book should be consulted.

SUMMARY.

1. "Let us live for our children", was Froebel's motto.
2. Habits are formed in early life; the conditions are then most favourable for mental, moral, and physical growth.
3. Special training, knowledge of child nature, and a natural disposition suited to the work are essential to the teacher of infants.
4. The main principles to be recognized are the spontaneous activities of the child, and the harmonious and complete development of the whole of a child's faculties.
5. The classes should be small and the lessons short. Ability should be the basis of classification.
6. The teacher, who by parental character inspires confidence, banishes fear, and encourages frankness of disposition, wins the child at a susceptible time of life, and can thus cultivate love, attention, order, neatness, cleanliness, and industry.
7. The lessons of the infant school should be more or less inter-connected.

This principle of association may be carried out through Kindergarten methods of teaching.

8. *The elementary subjects should, as far as possible, be connected with oral collective lessons.*

9. The object lessons of the infant school should be based on direct observation of natural objects. Some definite principle should be laid down in framing a list of subjects to be thus treated. Locality, seasons, continuity, connectedness, or working round one centre are principles which may govern the selection.

10. The manual and other employments will relieve younger children from the strain of ordinary lessons, and train them to observe and imitate.

11. Froebel's "Gifts" were the models or objects he employed as best adapted for training the senses of children.

GOVERNMENT QUESTIONS.

1. Describe the kind of manual employments best suited to give to very little children the ideas of form and of construction, and to give early training in invention and design.

2. "It should be borne in mind that it is of little service to adopt the 'gifts' and mechanical occupations of the Kindergarten unless they are so used as to furnish real training in accuracy of hand and eye, in intelligence, and in obedience" (Instructions to H.M. Inspectors). Explain and illustrate this passage, and show how a teacher can best give effect to its recommendation.

3. The Code requires that "appropriate occupations" shall be provided for children in an infant school, besides reading, writing, and arithmetic, and in common objects. What are the best of these "occupations", and what educative purpose do they serve?

4. Give the heads of a lesson on one of Froebel's "Gifts".

5. Explain the terms Kindergarten, Froebel's Gifts, and state fully the educational uses of the second and fourth gifts.

6. Detail some of the geometrical properties that may be taught to young children by folding square or rectangular pieces of paper, and give illustrative diagrams.

7. Give examples of kindergarten exercises that may be useful to stimulate invention and imitation in young children.

8. Enumerate Froebel's seven gifts, and show the progressive nature of their lessons.

9. Show that for some lessons, infant classes should be smaller in number than classes composed of older children; and that, for other lessons, one or more classes may be grouped.

10. Which of the manual employments of an infant school is most useful as a help in the teaching of writing? Explain and illustrate your answer.

11. What are the objects of kindergarten exercises? Give an outline of a course suitable for a junior infant class or Standard I., mentioning the apparatus required.

12. Of the three simple manual employments—building, plaiting, and elementary drawing—which do you think most helpful in the education of a child, and why? Explain how you would use and vary the exercise you prefer.

• CHAPTER VI.—OBJECT LESSONS.

I. Their Purpose.—*Circular 322* says: "Object lessons cannot be dispensed with if habits of *observation* are to be duly fostered; and they should be treated as a means of *mental exercise*, and not merely as opportunities for imparting information".

Frequently *object lessons* and *information lessons* are not carefully distinguished; yet the scope and method of the two lessons is essentially different.

"Object teaching leads the scholar to acquire knowledge by observation and experiment; and no instruction is properly so called unless an object is presented to the learner so that the addition to his knowledge may be made through the senses." But "if the children have no opportunity of handling or watching the actual object which is being dealt with, the teacher will be giving an information lesson rather than an object lesson" (*Circular 369*).

Among the aims to be kept in view are—

(1) *Training the Powers of Observation and Cultivating Habits of Attention*, thus fostering an increasing interest in all things around them. To teach children to recognize the beauties of the natural objects by which they are surrounded is to elevate their thoughts and deepen their sympathies.

(2) *Developing all the Senses*.—The senses are the "gateways of knowledge", and must be trained to find out readily and accurately whatever is worthy of note. Each is capable of high development and can work independently, but to greater effect when in co-operation with the others. Children should be taught how the knowledge gained by the one sense may be tested, confirmed, and extended by the others.

(3) *Imparting a Correct Knowledge of the Commonest Things*.—The discovery of the truth about common things will add to the general intelligence, correct previous erroneous impressions, and stimulate self-reliance; for the child sees that the knowledge has been gained by its own effort.

(4) *Increasing the Child's Vocabulary and Power of Expression*.—A clear mental picture must first be formed; then the power of describing what is seen will follow. Accurate description is to accompany accurate observation.

"After the children have been taught to observe a fact, they

should be practised in making a correct statement of it in a sentence of their own. This oral answering in complete sentences will lead to a correct use of the English language, both in talking and writing, and will store the mind with a useful vocabulary" (*Circular* 369).

(5) *Providing Active Employment.*—The co-operation of the children is an essential feature of a good object lesson. Opportunities will be found for encouraging and directing the activity of children when parts of the object have to be separated or put together, comparisons made, length or weight ascertained, &c. The lesson of industry is thus silently inculcated.

(6) *Satisfying Natural Curiosity.*—When children are helped to find the *why* and the *wherefore* of things, their natural inquisitiveness is being usefully and beneficially employed; but so far from being satisfied, a desire to question still more is often developed. This "wanting to know" is a healthy sign of mental development.

(7) *Stimulating the Inventive Powers.*—Children are imitators. The teacher brings to the lesson some piece of home-made apparatus the construction of which is explained. The child's interest is aroused, and he seeks to imitate and perhaps improve upon what he has seen. He is thus stimulated to test his powers of invention in other directions.

To sum up our remarks—"The first and most important thing is to teach the children to observe, compare, and contrast; the second is to impart information; and the third is to reinforce the other two by making the results of them the basis for instruction in language, drawing, number, modelling, and other hand-work" (*Circular* 369).

2. Aids to Successful Teaching.—The following aids tend to success:—

(1) **Specimens.**—As far as possible the actual object should be used. If it is too small to be seen distinctly by the whole class, then, wherever possible, sufficient numbers of the specimen should be provided for distribution round the class. When real specimens are not obtainable, models and pictures may serve as substitutes, but only imperfectly; therefore ability or inability to provide specimens will greatly restrict the choice of subjects. A variety of specimens is desirable;

and, as a rule, where a good collection is found, the children have co-operated in collecting it.

"No object should be chosen which the teacher cannot thoroughly illustrate, either by the object itself, or by some adequate representation of the object."

"The children should be encouraged to bring with them to the lesson illustrative specimens which they have collected or borrowed from friends" (*Circular 369*).

(2) **Models.**—These should be as correct as possible, and used only when the object itself is unobtainable. The prepared model or specimen is sometimes capable of imitation by the class as a varied occupation.

"Clay modelling and other manual occupations may be employed to test the accuracy of the impressions which the children form, and to fix them in their minds" (*Circular 332*).

(3) **Diagrams.**—These should be correctly drawn and coloured. When drawn with coloured chalks in the presence of the class they are very effective. The children should try to reproduce them.

"Teachers should frequently illustrate details of the lesson by black-board drawings. Children who are jaded in five minutes by a lecture will be open-eyed and receptive for half an hour while the teacher draws as well as talks."

"The children should be encouraged to make simple drawings illustrative of their observations whenever possible, and in certain cases to make simple records on squared paper" (*Circular 369*).

(4) **Pictures.**—These are but imperfect substitutes for the real object, but when they are the best means of illustration available they should be freely and intelligently used. A portfolio of pictures not placed on the school wall should be kept.

(5) **Apparatus.**—The more "home-made" apparatus is used the more likely it is to be imitated by the children. Of course perfect apparatus is desirable, but this should be supplemented by that of the teacher's own construction.

(6) **A Cabinet of Objects.**—Specimens used in lessons should be labelled and preserved for future use. Such collections are for use, not for show.

(7) **Mastery of the Subject.**—This subject offers a very wide field for research. General reading will always be useful

to supplement text-book information, but the best plan, whenever possible, is to study the object itself. This will enable the teacher to teach better than the study of any text-book alone can do. It is advisable to keep records of observations made, as well as the "notes of the lesson"; revision will thus be made easier, and the lessons become of increasing value by the addition of new information gained from time to time.

The teacher, to give a successful lesson, must thoroughly know his subject. There should be no necessity to use notes during the progress of the lesson.

Dry husks are of no educational value; the information must be full, clear, accurate, and adapted to the purpose of the lesson.

In the preparation of his lessons the teacher will gradually gather together an orderly collection of objects illustrative of life in town or country; geological and botanical specimens, examples of industrial processes, &c. In his search for these he should be aided by the co-operation of the children and their parents.

3. General Directions for Conducting the Lesson.

—"It should never be forgotten that, unless the lessons themselves are made attractive to these young children by their simplicity of treatment, by the suitability and variety of the illustrations, and by association with their everyday life, the most carefully drawn curriculum, and the most thoughtful arrangement of time-tables will fail to attract the children" (*Circular 332*).

(1) *Provide the real object, good models, or correctly coloured pictures.* The children should help in this.

(2) *Talk about the objects, and guide the children to acquire information for themselves* by making such a call upon their powers of observation and thought as their years and previous training may fairly warrant.

"If the scholars are to learn intelligently from their object lessons, the first requisite is trained attention. The right method of securing this is to direct in a conversational way the attention of the children to the different parts of the object in an orderly manner, and explain the relation of each part to the whole" (*Circular 369*).

The teacher, though perhaps quick, active, and ready, will do well to work out the different points of his subject in a series of strictly progressive questions, proceeding from the

better known facts to those more remote. He should never trust to hap-hazard questions. The facts of the lesson should, whenever possible, be illustrated by and associated with facts which have come under the child's previous observation.

(3) *Let the objects be not only seen but also handled*, and, perhaps, tasted or smelt. "Intentional doing" will arouse interest, and ensure that the knowledge to be acquired is really gained by observation and experience, and not by the ear only.

(4) *Let the description of the parts be systematic*, and taken in the order of their importance.

(5) *Demonstrate qualities, uses, &c., experimentally* by taking to pieces, dissolving, burning, &c.

(6) *Leave a vivid picture of the complete object*. "After the analysis or study of separate detail, the object should again be treated as a whole. It should not be left in fragments, but the division into parts should be followed, when possible, by the reconstruction of them into their original unity" (*Circular* 369).

By following these general directions the lessons will be made attractive to the children, and therefore secure voluntary attention. The class should be conveniently seated, so that the object may be seen by all. Light from either side is equally suitable.

4. Schemes for Systematizing the Work.—Every well-organized school has a prepared scheme of object lessons, about thirty in number being considered sufficient for a year's work. Time will thus be found for recapitulating and extending the lessons. These lessons should deal with the world of nature, and should therefore include—

- (1) Common objects of the home, street, &c.
- (2) Personal objects, as food, clothing, &c.
- (3) Common employments, as the builder, the baker, &c.
- (4) Substances employed in ordinary life, as soap, candles, &c.
- (5) Objects selected from the animal, vegetable, and mineral world.
- (6) Natural phenomena, as snow, ice, the sun, &c.
- (7) Form and colour.

Whether the scheme of lessons is attractive or not will depend upon the skill and enthusiasm of the teacher and the supply of suitable illustrations.

A closely interconnected and progressive course of lessons is somewhat difficult of attainment. The list not only has to extend horizontally along the line, as it were, in its connectedness, but to expand vertically in its continuity and increasing difficulty for more advanced classes.

Such schemes are worth developing; for by their connectedness they prevent undue isolation of lessons, by their association they increase interest and aid memory, and by their continuity they facilitate the progress of children when promoted to a higher class during the school year. The latter point is important; for the child thus promoted will then have some acquaintance with current lessons.

"Some scheme of lessons should be arranged in every school by which an intelligent habit of observation and simple reasoning may be fostered, while it cannot be too clearly pointed out that all the subjects simultaneously dealt with in a curriculum should be kept as closely interconnected and made as materially helpful as possible, and not be unduly isolated and specialized."

"With different treatment, the same object may be adapted to more than one division. Some teachers may prefer to deal with the same object in successive years, or to recur to it after a year's interval, expanding the study to suit the growing powers of the scholars" (*Circular* 369).

In the schemes (pp. 55-58; 68, 69) this principle has been borne in mind. We now give a few suggestions for preparing lists of lessons; but young teachers will do well to exchange lists with their friends.

5. Specimen Schemes :—

(a) *Home life* or some department of it. The breakfast, dinner, or tea table would be capable of extension for some thirty lessons, thus—

Vegetable kingdom.—Chair, table, cloth, bread, coffee, tea, &c.

Animal kingdom.—Milk, butter, eggs, bacon, &c.

Mineral kingdom.—Tray, tea-pot, cup and saucer, knife and fork, spoon, &c.

In the first place, these would be treated simply to obtain names, parts, colour, form, properties, &c. Afterwards the lessons would be extended to sources, qualities, adaptability to use, &c., and finally lessons would be given on the manufacture, classification of the objects, &c.

(b) *Domestic Pets and their homes.* Take as an example, "A bird and bird-cage". Here we should get lessons on birds of various kinds, feathers, beaks, feet, &c.; their food, water, sand; cleanliness; necessity of light, air, &c. Materials used in construction of the cage: wood, iron, &c.

(c) *Social life of towns, e.g. the tram.* Here we get lessons on the materials used, with their qualities and uses; the trades employed, the tools used, &c.; modes of travelling, &c.

(d) *The Calendar.* By observing the varying changes produced by the seasons on the land, in the sky, among animals, plants, &c., the calendar would form a good basis on which to build a series of lessons.

(e) *Classes of Animals*—(snails) invertebrate (herring) vertebrate. Now widen out thus—the *fish* as the type of the lowest vertebrate, compared with the amphibian *frog*, the reptile *snake*, the *bird*, the mammal *cow*. Here then are only five creatures, but their natural history will afford valuable lessons as well as teach the general principles of classification.

The lessons should treat of the structure, movements, reproduction, habits, food, covering, uses, and adaptability of structure to use.

SPECIMEN LESSONS.

CONVERSATIONAL OBJECT LESSON ON

A KITTEN.

Class. Babies.

Time. Two lessons of 15 minutes.

Aim. To train the little ones to notice the kitten and its ways, and to talk about what they find out.

Apparatus. A kitten; picture of cat; saucer of milk; bed-basket.

First Step. The Warm Coat.—Kitten shown in its bed. Child invited to stroke it, then to take it out of its bed. Feel the bed. How does it feel?—*It feels warm.* What has made it warm?—*Pussy has made it warm.* Stroke pussy. How does her coat feel?—*It feels smooth and soft.* Stroke your dress. It is not so smooth and soft as pussy's coat. What is her coat made of?—*It is made of fur.* What colour is pussy's coat?—*Pussy's coat is black.* Point to anything you have on which is black. When puss is rolled up in her bed what does she look like?—*She looks like a black ball.* How did she feel in your arms?—*She felt warm.* Is she heavy?—*She is not so heavy as the cat.*

Repeat—

"I love little pussy, her coat is so warm."

Second Step. Body and Limbs.—Place puss on the table. How does she stand?—*She stands on her legs.* How many legs has she?—*She has four legs.* How many legs have you?—*I have two legs.* What other animal has two legs?—*A bird has two legs.* What animal has four legs?—*A horse has four legs.* What do the legs hold up?—*The legs hold up the body.* What sort of a body has puss?—*She has a long body.* The teacher takes hold of the foot. What is this?—*It is the foot.* What is the foot called?—*It is called the paw.* Stroke it. How does it feel?—*It feels soft.* All listen while puss walks. Why cannot you hear her?—*Because her paws are soft.* Who has seen a cat scratch? Something sharp came out of her paw. What was it?—*It was her claw.* Where are this pussy's claws?—*Her claws are in her paws.* When does puss put out her claws?—*When she wants to hurt something.* What does she want sharp claws for?—*She wants them to catch mice.* How does she sharpen them?—*She sharpens them against the table.* What have you like claws?—*We have nails.* Can you hide them? What is this?—*It is her tail.* May I pull it? Why not?—*Because you may hurt her.*

Repeat—

"I love little pussy, her coat is so warm,
And if I don't hurt her, she'll do me no harm;
I'll not pull her tail, or drive her away,
But pussy and I very gently will play."

[*Note.*—Complete answers will not be given in the following steps, as the kind of answer required is illustrated above.]

Third Step. The Head.—What is this part of puss?—*Head.* Put your hands on your head. What are these?—*Eyes.* How many eyes has she? Count *One, Two*; now count your own eyes. What are these?—*Ears.* How many ears has puss? Count *One, Two*; now count your own ears. Look in the middle of the little child's eye at your side. What do you see?—*A round spot.* Look at pussy's eye. What do you see?—*A narrow slit.* Sometimes you will see a round spot. What sort of ears are they?—*Long ears.* What are her ears for? What is this?—*Nose.* Feel it. How does it feel?—*Cold.* What is this?—*Mouth.* What can you see inside?—*Teeth and tongue.* What are these?—*Whiskers.* What use are they?

Fourth Step. Pussy's Ways.—Place a saucer of milk before puss. What does she do?—*Laps.* Take her in your arms and

stroke her. What is puss doing?—*Purring*. What other noise does puss make?—*Mews*. Point to picture of cat. Who is this?—*Kitten's mother*. What does its mother do for it?—*Takes care of it*. Who washes you? Who washes the kitten? Who washes the cat? What does it wash itself with?

Repeat—

"I love little pussy, her coat is so warm", &c.

The above outline is only suggestive: the teacher may curtail or lengthen it as circumstances require. The essential point is that the children must be made to co-operate with the teacher and talk freely. The answers they give will be formed by the teacher into little sentences, and then repeated after the teacher.

Never allow the lesson to be continued so long that the children become tired and lose interest in it.

NOTES OF A LESSON ON THE CAT.

Class. Middle Division.

Time. 20 minutes (or 2 quarters).

Aim. To collect and extend the knowledge previously acquired by observation; and to inculcate tenderness, cleanliness, and care of pets.

Illustrations. Kitten; picture of cat; drawings of ears, eyes, teeth, paws, pads, claws; a cylinder; a circle.

SUBJECT MATTER.

I. What Puss is Like.

A cat has a long, round, thin body, which is covered with fur of varied colour. Its head is round, the ears are short and erect, the eyes sharp, the mouth strong, the tongue rough. The teeth are made for cutting. Below the nostrils are whiskers. The four legs have padded feet or paws. The forepaws have seven pads and five toes; while the hind ones have five pads and four toes. Each toe has a sharp claw which can be drawn into a sheath. A cat has a long tail.

METHOD AND USE OF ILLUSTRATIONS.

Direct attention to the form of the kitten's body in the picture. Compare it with a cylinder. Contrast the cat's clothing with the child's. Draw the head, and note its shape; compare with circle. Draw the two ears and two eyes. Watch the ears move. Make a noise, and note its quickness to hear. Point to the change in the eyes. Examine the teeth; compare with edge of chisel. Notice rough tongue for scraping bones, and compare with file. Notice a bald patch under the nose, and the long hairs; illustrate the use of the latter. Count the legs. Draw the foot. Show the pads, toes, and claws, and obtain from the children the use of each. Count the total number of pads and toes. Compare claws with tooth-pick which can be pushed out or drawn back.

SUBJECT MATTER.

II. How Puss Lives.

1. The cat loves to lie before the fire, or in the sunshine.

2. Feeds on flesh, and milk.

3. Listens to slightest sounds; watches for prey; springs on it; climbs trees; smells keenly.

4. Purrs when pleased, also rubs herself against one; mews when in want, and growls about uneasily; growls when angry.

5. Cleans herself and her kittens.

III. Why we Keep Puss.

1. A pet with which to play.

2. A companion to make the house homely.

3. A scavenger to clear up scraps, &c.

4. The enemy of mice and rats.

IV. Recapitulation.

METHOD AND USE OF ILLUSTRATIONS.

1. Question children on pussy's favourite place.

2. Notice the movements of the jaw and tongue. Compare movements of mouth with a cow's and with their own.

3, 4, 5. These habits of the cat are well known, and with a little skilful questioning can be obtained from the children.

4. Use this to teach that cats, like children, appreciate and return kindness; and also the duty of attending to the wants of dumb pets.

5. Enforce the lesson of cleanliness. Pets like to be clean. Children must therefore attend to their wants.

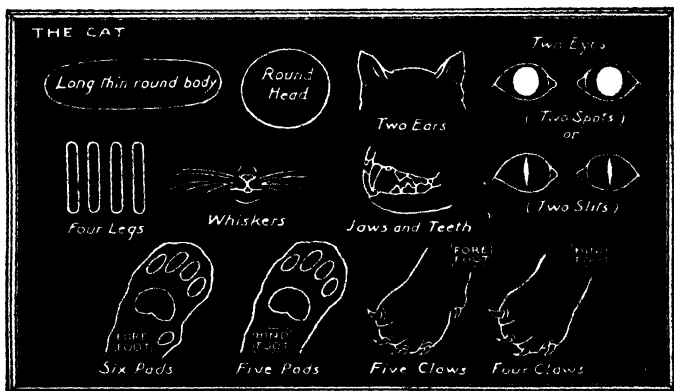
1 and 2. Seize the opportunity for teaching gentleness and kindness, not only to pets but also to each other.

3. The wickedness of waste may be touched on. What we do not need may keep others alive.

4. The use of the cat is well known. Show that it saves us from loss and annoyance.

Recapitulate and revise from the black-board.

BLACK-BOARD SUMMARY.



Puss likes to be warm. Fish and milk are good for her.
 Puss hears and sees quickly. Be kind to pets.
 The cat washes with its paws.
 Mice eat our food. Cats catch mice.

The summary can be used for a reading lesson. If all were carefully graphed off, they would form useful reading lessons for a future occasion, as well as serve the purpose of revision.

From the above lesson it will be seen that lessons in number, writing, reading, form, colour, &c., may be easily associated with, and grow out of the object lesson.

NOTES OF A LESSON ON THE CAT AND THE DOG.

Class. Upper Division.

Time. 30 minutes.

Aim. To exercise the judgment in observing similarities and dissimilarities in animals.

Illustrations. A cat, a dog (alive or stuffed). Pictures of cats, dogs. Diagrams of parts.

SUBJECT MATTER. •

I. Comparison of Appearance.

(a) Cats' bodies are much alike in form and size. Dogs differ.

(b) Each has 4 legs, 18 toes, pads, and claws; but the dog cannot sheath its claws, and so walks noisily.

(c) Heads differ — cats' are round; dogs' are pointed.

(d) Teeth are very similar.

(e) The cat has a rough dry tongue; a dog has a soft and wet one, which it hangs out when running.

(f) Both have warm coats; but the one has fur, the other hair.

(g) Both have long tails. Some dogs have bushy tails. •

II. Comparison of Habits.

(a) Both like warmth; but the dog disregards the fire more.

(b) Both eat similar food; but the dog is not so dainty.

(c) Both have the senses of sight, smell, and hearing very acute.

METHOD AND ILLUSTRATION.

I. Let the children examine the parts under the teacher's direction, either in the pictures or in the animals.

(a) Refer to the variety in the size of dogs.

(b) Note the claws get blunted through the want of protection and the habit of digging. Note also the cause of noisier walking.

(c) Let the children make drawings of dog's and cat's heads, side by side.

(d) Compare the teeth.

(e) Feel the tongues and note the differences. Note the habit of hanging out the tongue. When? Tell the reason.

(f) Let the child close its eyes and stroke the coats of each, and note the difference.

(g) Note differences.

II. (a) Refer to the dog living in a kennel, and the cat in the house.

(b) Lead the children to infer that the dog's sense of taste is not so acute.

(c) Note that by smell the dog recognizes friends and scents prey.

SUBJECT MATTER.

METHOD AND ILLUSTRATION.

(d) Both run fast; but dog runs the faster. The dog is not a good climber.

(e) The cat is fonder of the house than the person. The dog is the reverse.

(f) Both rub against the person when pleased; but dog also jumps up and wags his tail. When angry the cat scratches; but the dog bites.

(g) Puss mews and purrs; the dog barks, whines when in trouble, and growls in anger.

(h) The cat cleans itself. The dog wants washing.

(d) Bring out by questioning the necessity of speed to catch prey.

(e) Relate a story showing the dog's affection.

(f) Advise non-interference with strange cats or dogs.

(g) Contrast the voices; mimic them.

(h) Inculcate cleanly habits.

III. Comparison of Usefulness.

(a) Both pets.

(b) Both companions, but dogs more so.

(c) Both clear up scraps, &c.

(d) Both kill mice and rats.

Added to these the dog—

(e) Guards property.

(f) Rescues life.

(g) Hunts animals.

(h) Carries or draws loads.

III. (a) Show how to treat pets kindly, and teach the lesson of kindness.

(b) Impress the companionship and faithfulness of dogs.

(c) Illustrate by the watch-dog and sheep-dog.

(f) Show picture of a rescue from drowning or snow.

(g) By questioning bring out that packs of dogs are kept for hunting.

(h) Show picture of Esquimaux dogs.

IV. Recapitulation.

IV. Recapitulate and revise from the black-board.

BLACK-BOARD SUMMARY.

Here will appear sketches to illustrate the different points of contrast brought out during the lesson, together with short statements of the more important points.

OUTLINE OF A LESSON ON

THE COLOUR BLUE.

Class. Babies.

Time. 15 minutes.

Aim. To train children to distinguish the colour "blue" by means of contrast and likeness.

Illustrations. Various coloured papers, cards, beads, cottons, cloths, &c. The Colour Chart. Place the papers in one heap, the cards in another, and so on.

First Step. Distinguishing the Colour.—Bring as many children to the front as there are heaps of different materials.

The teacher holds up a large blue paper, and asks one child to pick out from the heap a *paper* of the same colour; another a *card* of the same colour; another a *bead*, and so on. Teacher and children now place their articles together to be observed by the class, and the similarity of colour noted. The other children are now exercised in a similar way, being required to pick out the colour from articles placed before them.

The teacher now places a *red* paper beside the *blue* for the children to note the contrast. Other colours are placed in juxtaposition to the blue.

The children now recognize the colour on the colour chart.

Second Step. Naming the Colour.—All the blue articles selected are now placed in one heap, and the articles of other colours in another.

The teacher now holds up a blue *paper* and says "This paper is blue". A *bead* is then held up, and the children say "This bead is blue". The same is done with the other articles.

The teacher prints a B on the black-board, and the children say "B for Blue".

Blue is now pointed out on the colour chart, and named.

Third Step. Exercises.—The children are now asked to name anything blue in the room; *e.g.* a scarf, a dress, a ball. Then name anything blue outside the room; *e.g.* the sky, blue water for washing, a blue cup, &c.

For *teaching* a colour a lesson somewhat similar to the above is the most effective; but the colour should be *impressed* in connection with the various lessons on different objects.

OUTLINE OF A LESSON ON

THE SQUARE.

Class. Babies.

Time. 15 minutes.

Aim. By synthesis and analysis to enable the children to recognize the form of a square.

Materials. Sticks 3" long. Papers 3" square. Any square articles, *e.g.* book, picture-frame, &c. Form Chart.

First Step. Building up the Form.—Each child and the teacher to be supplied with sticks. Children seated in squared desks; teacher's desk to be also squared.

Children first count their sticks—*one, two, three, four*; then place them side by side on the lines of the desk, thus | | | |, and show that the sticks are all the same length. Count again.

The previous lessons on "upright" and "lying-down" lines are revised by laying the sticks in these positions.

The children now imitate the teacher's actions and say—

"One upright stick"; "two upright sticks".



Then, "One lying-down stick"; "two lying-down sticks".

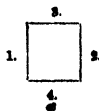
Pointing with both hands and imitating the teacher they now say—

"Two upright sticks"; "two lying-down sticks".



Again count the sticks, pointing and saying "One stick, two sticks, three sticks, four sticks". After this say "One side, two sides, three sides, four sides".

In this way impress that the figure has four sides all the same length.



Next count the corners, and show that the figure has four corners.

Second Step. Analysing the Form.—Distribute the squares of paper. Take the sticks one by one and lay them on the edges of the paper, going through exactly the same series of exercises, and in the same order as before; in this way leading the children to see that the paper given them has—

- (a) two upright sides and two lying-down sides,
- (b) four sides all the same length,
- (c) four corners.

Third Step. Naming the Form.—The teacher now holds up the paper, the children imitate, and repeat "This paper is square". Then pointing to the sticks, they say, "I have made a square". They then place one square of paper on another of exactly the same size, and say, "I have one square"; "I have two squares".

Fourth Step. Exercises.—Let the children point out the square on the form chart; then name any square articles on the table or in the room.

N.B.—Do not attempt to form a definition. It is quite sufficient if the children can recognize a square and know that it has four sides and four corners.

SUMMARY.

1. Any lesson which involves an examination of the object may be called an object lesson; but if no object is presented it is simply an information lesson.

2. The aims of the object lesson are: (1) To teach children to observe, to compare, and to contrast; (2) To impart information; (3) To form the basis for instruction in language, drawing, number, modelling, and other hand-work.

3. A suitable and sufficient collection of specimens, models, diagrams, pictures, &c., must be provided.

4. Interest must be aroused and the lessons made attractive by careful preparation both of the matter and the illustrations, skilful presentation of both, and by enthusiastic teaching.

5. The children must actively co-operate in the work.

6. A systematic scheme of object lessons must be drawn up. Thirty lessons are sufficient.

7. The lessons must be interconnected, progressive, and capable of illustration by material objects. They must be associated with the general subjects of instruction, and provide for continuity from class to class.

GOVERNMENT QUESTIONS.

1. Make a list of twenty lessons on familiar animals; and explain the order in which you have arranged them.

2. Name the qualities you would select in giving an object lesson to infants on "Steel"; and state the experiments or illustrations by which you would elicit the ideas before giving the names of the qualities.

3. Detail the apparatus required for lessons on a "Coal Mine", and on the "Seasons"; and draw the diagrams required for the latter.

4. Point out some of the uses of object lessons in infant schools; and illustrate your answers by short notes of a lesson on the "Whale" or on "Iron".

5. For what purposes are lessons in form and colour given to infants? Name the order in which the principal plane figures should be taught.

6. Write out brief notes of a lesson on "Glass"; and explain your purpose in teaching the names of the qualities.

7. Make out a list of lessons on "Common Things" illustrative of the pressure of the atmosphere, and give brief heads of one of such lessons.

8. What is the advantage to young children of having lessons on such subjects as a spider, wool, sugar? Enumerate the qualities or peculiarities in each case to which you would specially direct their attention.

9. In giving an object lesson, what is the aim of the teacher in using terms denoting the qualities of the object? What is meant by vulgar and pedantic language?

10. Write notes of a lesson on the Square and its Properties (either by paper-folding or drawing).

11. Write full notes of a lesson (matter only) on "A Country Walk" or "What to Notice in Shop Windows". or "The Uses of Fire".

12. Write notes of a lesson on the colour "Green" or "Blue".

13. Write notes of a lesson on the Primary Colours, or the Colours of the Rainbow.

14. What educational purposes are served by the systematic giving of object lessons? What points ought you specially to bear in mind in your

own preparation of such lessons? By what rules would you be guided as to your manner and language in giving the lesson; and what rules would you lay down for your scholars as to their way of answering?

15. Sketch a conversational lesson on "Building a House".

16. Write notes of a lesson on "Cleanliness".

17. How would you teach the difference between Primary and Secondary Colours? What simpler names would you give?

18. Sketch out a course of lessons on common objects, or on the phenomena of daily life, suitable for Standards I., II., and III.

CHAPTER VII.—READING.

I.—READING IN THE INFANT SCHOOL.

1. The Importance of Reading.—Of all the subjects of school instruction, reading undoubtedly occupies the foremost place, when viewed from the standpoint of practical utility. When once the ability to read with ease is acquired, there is no branch of knowledge in which the person may not, with perseverance, become proficient; for it is the key to all knowledge.

No longer is the power to read regarded as an accomplishment; on the other hand, inability to read is looked on as a disgrace. Reading is essential to poor and rich alike. To the poorest child earning its daily bread in the humblest walk of life, as well as to the man of business, reading is the *sine qua non* of success.

In its pursuit the child, as well as the adult, has opened up to him an unfailing source of pleasure and recreation, available at all times; whilst he who has learnt to read aloud with fluency and expression, is able to entertain not only himself, but also his friends.

When once the love of reading is instilled, it may become, if rightly directed, a powerful lever both to moral and intellectual, as well as to social advancement. It therefore behoves the teacher to do his utmost to smooth the learner's path, and to make the reading lessons such a source of pleasure that, when the child leaves school, he may regard the power acquired as one of his most cherished possessions, and one to be still further cultivated.

2. What is Good Reading?—A child may be said to have learnt the mechanical part of reading, when he has

acquired the power of recognizing in certain signs words with which he is already familiar; but more than this must be done before the child can be said to read *well*.

Good reading implies—

(1) A clear and full grasp of the ideas which the writer seeks to convey; and

(2) Ability so to utter the words expressing these ideas that the thoughts and feelings of the writer are conveyed to the hearer.

It will, therefore, be at once seen that good reading requires intelligence, a quick and ready grasp of the sense of what is read, and a sensitiveness of feeling which causes the reader to be imbued with, and to reproduce the sentiments of the writer.

This is the ultimate aim of the teacher. On the thoroughness of his instruction will depend the greater or less approach his pupils will make to the high standard of excellence here set up.

3. Special Work of this Stage.—It is evident from the above that the intellectual part of reading must be delayed till the child reaches the Senior School. The work of the Infant School teacher is to overcome the earlier mechanical difficulties of the problem of teaching to read. These are by no means slight, and will require much patience and skilful teaching before the end will be attained.

It is well that the teacher should clearly apprehend the nature of the task she has to perform. Briefly stated, the work of the Infant School teacher is—

(1) *To enable children to recognize in certain signs sounds with which they are already familiar.*

Each spoken word has its corresponding sign; and it is the connection between the two which the teacher has to establish in the child's mind. Plainly, then, the child should not begin to learn to read until it has acquired fair facility of speech.

(2) *To enable children to associate both the sound and its arbitrary sign with the idea which underlies it.*

A child may, from constantly hearing it used by its parents, be familiar with the sound of the word "train", and may be taught to recognize the sign for "train"; but unless sound and sign are associated in the child's mind with what a train really is, the reading lesson has failed in part of its object.

- (3) *To get the eye so accustomed to the signs that they are recognized, and the sounds pronounced with the greatest freedom.*

If this is to be done well, too great a variety of words must not be presented. Quick recognition is essential to future progress. The danger of a limited amount of matter is that the children will learn the lessons by heart. This can be obviated by the teacher using the black-board freely, to present the same words again and again in totally different sentences. Books are also now published in which an abundance of entertaining reading is based upon a very limited vocabulary; so that the child is constantly meeting the same words in new connections.

- (4) *To teach clearness and accuracy of pronunciation.*

This is a very important part of teaching to read. Prevention is better than cure. If in the early stages strict attention be given to the correct production of the vowels and consonants, the many hours now devoted in the Senior School to securing purity and distinctness of utterance, might be more profitably employed. Much of the difficulty which the child experiences in spelling arises from the same cause.

- (5) *To teach the natural grouping of words.*

Too much must not be expected here where the mechanical difficulties to be overcome are so numerous; but when the child leaves the Infant School, we may reasonably expect that it shall be able to read the little book whose word difficulties it has mastered, not by jerking out the words one at a time in a monotone, but by grouping two or three together into little phrases uttered in a natural style.

4. Difficulties to be Encountered.—The difficulty of learning to read arises chiefly from the imperfections of the alphabet. If our alphabet was perfect, there would be a distinct sign for every sound, and each sound would be represented by only one sign. Our reading and spelling would then be phonetic. In shorthand we have this perfect alphabet.

In our alphabet we have but 22 effective signs (*c, j, q, and x* can be represented by other letters) to represent at least 43 distinct sounds. It therefore follows that *the same sign must represent more than one sound*, e.g. *a* in *at, ate, all, cart, bare*; *e* in *me, her, met*; *o* in *no, not, move, &c.*

The difficulty is still further increased by *the same sound being represented by different signs*. Miss Soames in her *Phonetics*

gives the following twenty words to show that the vowel-sound of the word *fate* is written in twenty different ways: fate, lady, fail, may, played, they, eh, obeyed, vein, reign, weighed, break, straight, gaol, trait, halfpenny, guage, dahlia, campaign, champagne.

In addition to the above deficiencies we have *many words with silent letters*, e.g. light, doubt, road, know, write.

When we remember that "the language contains 1300 words, the notation of which is not in harmony with the pronunciation; and these 1300 words are the commonest—the most in daily use; and that of these, 800 are monosyllables—and these too in most common use" (Meiklejohn), we shall at once perceive the fallacy of the popular notion that the teaching of reading is easy, and requires little preparation or skill on the part of the teacher. Little words such as **to, any, one, was, you, &c.**, are most irregular.

5. The Aids Available:

(1) **From the Children themselves.**—For both teacher and children it is fortunate that at an early age children are not critical; they have full confidence in the teacher, and believe implicitly what they are told. Thus in the sentence—The boy won one prize—they accept unhesitatingly the fact that "won" and "one" are both to be pronounced alike. The difficulty, apparent to an adult, of the same sound for two totally distinct signs is unperceived by them. Hence the anomalies of our language are not as great a stumbling-block to children as they are generally supposed to be.

The work of this early stage is chiefly observing signs and committing them to memory. Young children have retentive memories; therefore if the teacher take pains to *arouse interest* in the signs, and *secure close observation*, they will be retained in the memory. That this may be effectively done, the number of new signs presented at one time should be strictly limited.

Children love pictures; they never tire of looking at them and talking about them. The wise teacher will take advantage of this. Having secured interest in the thing through the picture, the sign for the name of the thing will be presented and associated with it, and thus both will be impressed on the memory.

Another characteristic of childhood, the love of *doing*, should be utilized in teaching to read. The child likes to handle things; to put them together and to pull them apart; it likes

to construct forms, to draw and to trace. All these modes of activity will become, in the hands of a skilful teacher, important aids for arousing interest in, and securing the recognition of the signs which have to be taught.

Again, curiosity is natural to children; they are eager to find out things; and are always asking "What is this?" "What does this do?" Such a condition of mind is a vantage ground for the teacher. When the child is in the frame of mind to receive information with respect to a thing, not only the thing, but also its *sign* will be easily remembered.

(2) **From the Teacher.**—The genuine teacher will delight in smoothing the children's path. Time will not be grudged for the preparation of subject matter or illustrations, if difficulties are thereby removed and progress secured. In the early lessons the skilful teacher will be careful to present words only of *regular notation*. By this course the children will acquire confidence in applying the knowledge gained by the mastery of one set of words to solving the difficulties of fresh words. Law and regularity must first be taught; eye and ear must be in accord.

Monotony is a great obstacle to progress; yet frequent revision is absolutely necessary. Here, again, the earnest teacher comes to her task prepared with the old words in a new dress, and thus maintains the interest of the little ones.

Reading in *sentences* lends additional interest. To form these some of the irregular monosyllables must necessarily be introduced; but our typical teacher is careful so to choose her sentences that these irregularities shall be reduced to a minimum; that they shall be presented and taught as wholes; and that the same words shall appear again and again in different sentences, till they come to be regarded by the children as old friends whose faces are perfectly familiar.

She is a diligent collector. In her portfolio are gathered together pictures of all sorts and sizes, by means of which she can illustrate any group of words she is teaching, and at the same time be sure of securing the close attention of those she teaches. Should she read a story suitable to her purpose, it is at once transferred to her Common-place Book for future use.

By her bright and winning manner, by her genuine sympathy with the children in their difficulties, by her encouraging words and marked approval of every real effort, she stimulates the children to do their best, and never fails to secure their co-operation. The lesson is in truth "Reading without tears",

(3) **From Apparatus.**—The chief apparatus required for the reading lesson is:

(a) *The Black-board.*—That those who neglect to thoroughly use the black-board in teaching to read lose the most powerful aid, is a safe assertion. By its use the teacher can command the close attention of every member of the class. The words are made to grow in sight of the children; each word as it is formed by the new addition is pronounced. All eyes are directed to the board; the teacher, therefore, has the face of every little one full in view, and can watch the placing of teeth and lips in order to secure accuracy of pronunciation. Since each word is pronounced as it is formed, and, moreover, under strict supervision, black-board teaching is almost invariably accompanied by purity and accuracy of utterance.

When the early stages of reading are taught from sheets or books, the teacher is bound to the words contained in them, whether they are adapted to the special needs of her class or not. Her revision work must be done from the same sentences; of these the children are tired, and, consequently, their interest flags. Where the teaching is from the black-board the reverse is the case: the teacher can introduce the words best adapted to the present stage of progress; and interest can be secured, even in the work of revision, by presenting the words in new sentences.

On the blackboard, too, the teacher can rapidly make sketches with coloured chalks; these interest the children, and are an effective means of associating sign and idea.

What the teacher has done, that the children are ever ready to attempt. In this way they can draw on their slates, stroke by stroke with the teacher, a simplified form of letter, easy words, &c.

(b) *The Word-building Box or Frame.*—This is a box divided into compartments, each of which contains a letter of the alphabet printed on a piece of cardboard. Either the cover of the box is provided with grooves into which the letters fit, or else a frame is used for this purpose.

In use it possesses the same advantages as the black-board affords. The letters being black on white, like those in the reading-books, and more perfect in formation than those made by the teacher, the box, in these respects, possesses additional advantages. The letters, however, are not so easily copied by the children.

(c) *Pictures and Specimens.*—No teacher who understands little children will neglect to avail herself of the great assistance afforded either by the actual object or its representation. Pictures are helpful at every stage of progress, whether it is the alphabet being taught, or the individual word, or a tale being read. But the teacher must be on her guard lest pictures and specimens fail to fulfil their purpose.

A picture rightly used, should attract attention to the word it is intended to illustrate; it should enable children to form the connection between word and idea; and it should lead to the intelligent use of words.

The picture should interpret the reading lesson; the two should be interdependent. When a picture does not do this it fails in its purpose, and is sometimes positively mischievous, because it takes the children's attention from their reading.

(d) *Kindergarten Occupations.*—Many of these are of great service in lending variety and brightness to what is in itself mechanical and uninteresting; and in the hands of a skilful teacher they afford the best means for imparting instruction in the first steps of learning to read.

By means of the Kindergarten Alphabet Box the capital letters may be easily and pleasantly taught; the small letters are not so easily made. Sticks and rings lend themselves readily to the same purpose. Drawing, and forming letters in sand are valuable teacher's aids.

(e) *Reading Sheets and Books.*—The greatest care must be exercised in the selection of these. The teacher must see that they are drawn up on the same system as she means to adopt in her teaching; that they are well graded and illustrated; and that the type is good, the binding strong, and the matter varied, interesting, and well written.

6. The Methods in Use.—There may be said to be three generally recognized methods of teaching to read. These are known as:

(1) **The Synthetic Method.**—In this method the elements of which words are composed are first taught; when this is done the elements are combined to form words. Some who adopt this method teach the **names** of the letters, others teach their **powers** or sounds.

(2) **The Analytic Method.**—When this method is adopted, the child is given, and is taught to recognize words as wholes;

afterwards the words thus taught are analysed, and the elements of which they are composed are examined and named.

(3) **The Combined Method.**—This, as its name implies, combines the best features of each of the above methods.

The Rev. T. W. Sharpe, Her Majesty's Senior Chief Inspector, says—"In infant schools reading thrives best when divided into three stages:—

- (a) **Phonic**, or the teaching of the sounds of the letters and of their more common combinations by distinct articulation, employing the proper organs of sound, lips, teeth, &c.
- (b) **Word-building** (using both the printed and written characters) with pictures and short sentences embodying the words constructed.
- (c) The combination of black-board teaching for proper phrasing of the sentences, and of the printed book for the interest of a continuous story."—*Blue Book*.

7. The chief Synthetic Methods.

The best known of these are:—

(1) **The Alphabetic Method.**—This is the oldest and by far the most mechanical of all the methods in use. The child is first taught the **names** of all the letters in the alphabet; it then learns to pronounce words by naming all the letters of which the word is composed.

It is really a method of teaching reading and spelling at the same time; and this is its chief advantage. But since spelling is chiefly learnt through the eye, a child who reads well will spell well; therefore it is wrong, for the sake of teaching spelling, to hamper a child's progress in reading. By repeated practice with the same words, a child does eventually attain a certain measure of mechanical success by following this plan; but it is none the less an unsound method. It is because the child unconsciously acquires the *powers* of letters and combinations of them by repeatedly meeting them in the same positions and observing the sounds of the words of which they form a part, that he is able to make any progress.

Against this system it may fairly be urged that the *names* of the letters when combined rarely suggest the *sound* of the whole word, e.g. see—ay—tee when combined bear no resemblance to the sound of the word *cat*.

Naming the letters only distracts and divides the attention,

which should be fixed on the sound of the word as a whole. The names, moreover, are frequently a positive hindrance to acquiring the sound of the word. Droning out the names of the letters is weary, monotonous work, and deadens the interest and intellectual life of the children in their task. Children taught on this system are very rarely fluent readers; every new word has to be spelled before it can be pronounced.

Nothing but the force of custom and the little skill required to teach by this method, has enabled it to survive in the comparatively few cases now to be found.

(2) **The Phonic Method.**—Where this system is adopted, the children are first taught the **powers** of the letters instead of their names. The method is newer and better; for when the sounds of successive letters are rapidly combined the result is, in a great number of cases, a far nearer approach to the sound of the word as a whole than is produced by the names of the letters. But, unfortunately, the same letter has different sounds in different words. Children are frequently taught to attach the correct sound to the letter by placing certain marks over it, *e.g.* fâte, fât, ârt; cake, çity. *Silent* letters are indicated by printing them in italics (*doubt*), or by placing them a little above the other letters (*doubt*). By devices such as these, a more or less perfect alphabet is formed in which each sound is represented by a different sign.

It will at once be apparent that the number of signs to be learnt is greatly increased, and therefore the drudgery is greater. A skilful teacher will, however, teach but few sounds at a time, and will lend interest to the work by combining these sounds to form words.

Against the system it is urged, with a good deal of truth, that it is impossible to sound the consonants by themselves; and, further, that the attempt to sound some of the consonants, *e.g.* **d, t, b, p**, has a tendency to produce stammering.

Even with the most skilful teaching, there are a great number of **irregular** words, and among them some of the shortest and most frequently used, which altogether defy phonetic pronunciation. These must be taught as wholes.

Elements of words have little interest for children; therefore unless the teacher is exceptionally bright, skilful, and painstaking, and is able to secure the closest attention from every child in the class, the lesson soon becomes wearisome and the results disappointing. She needs also to have a good know-

ledge of the exact way in which the organs of speech are to be placed in order to produce the different sounds with accuracy.

In the hands of a good teacher the phonic method is capable of producing very satisfactory results. It certainly aids purity and distinctness of articulation; it gives the power to attack new words; and the knowledge of the sounds of letters is a considerable help to spelling. The words taught in the earlier lessons must be very carefully classified so that the same vowel sound shall be presented in each word of the group.

(3) **The Phonetic Method.**—This method is similar to the phonic in that it teaches the **sounds** of the letters and not their names. It aims also at presenting a distinct sign for each sound. This it does, not by employing the present letters of the alphabet alone with certain distinguishing marks added, but by introducing altogether **new signs**. These signs are made to somewhat resemble the original letter of which the sound is a variation. The whole thus forms a greatly extended alphabet, sometimes including above sixty signs. Since the child has eventually to read words printed in the ordinary characters, he has really *two notations* to learn.

The transition from one to the other is effected by requiring the child to read the book he has been using in the phonetic characters, printed in the ordinary letters of the alphabet. It is claimed that the transition is made with comparative ease. The system is, however, very rarely adopted at present.

8. The chief Analytic Methods.

In the foremost place under this system of teaching must be placed—

(1) **The Look-and-Say Method.**—This is the direct opposite of the preceding methods; the child is first taught the whole, and then proceeds to examine the parts of which the whole is composed. This is following the natural order of speech. In teaching a child to speak, we do not teach it the elementary sounds and then show how to combine them to form the name of the object; it learns the name by pronouncing the whole word at once; and by repeatedly uttering the sound the name of the object is acquired. The name—"Look-and-Say"—indicates that this is the plan pursued by those who adopt this method.

The plan is in accordance with the educational maxim, "Proceed from the known to the unknown"; for by this method we are able to utilize the child's present knowledge

of things, and therefore at once to secure its interest in the work. From the first lesson the child sees the use of what it is doing; it feels it is acquiring a new power, and this of itself is a stimulus to exertion. The elements of words convey no meaning to the child, but the whole word does. The whole attention can be given to the main purpose in hand, namely the connection of sign, sound, and idea. The two latter are already known; therefore the attention can be concentrated on the one *new* element—the sign. Words and ideas are closely associated at once; and it is this close association which so effectually helps the mind to retain the sign.

Whatever system is adopted, this is *the* system which must be used in teaching the many *irregular words* which infants must sooner or later learn to recognize.

Against this system it is urged that each word sign has to be taught separately, Chinese fashion, for that the mastery of a few words gives no power to attack new ones; that the close similarity between words leads to confusion in recognizing them, *e.g.* *form* and *from* are confounded; and that the want of attention to the elements of words produces bad spelling and imperfect pronunciation.

There is a good deal of truth in these contentions, especially when, as is sometimes the case, the books used are unsuited to the system. But much can be done by good teaching to remove to a great extent the weaknesses pointed out.

With a very careful classification of words, especially in the earlier lessons, the child does unconsciously, by observing in words the effects of particular letters and combinations of letters, acquire the *powers* of those letters; and thus is able to attack new words in which the same letter or combination of letters occur under similar circumstances.

If the teacher is alive to the danger of inaccurate pronunciation, and is on the watch to check its occurrence, accuracy can be secured by close imitation of the teacher's model, and careful attention to securing the proper position of the organs of speech.

The close attention to the elements of words required in transcribing, is a useful corrective for defective spelling.

The system, then, clearly has its merits, but also its dangers.

(2) **The Syllabic Method.**—In the early stages the system is much the same as the "Look-and-Say". Syllables are taught and recognized, and then are combined to form other words.

9. The Combined Method.

This is sometimes known as the **Word-building** method. It combines some of the features of both the *Analytic* and *Synthetic* methods. Words are grouped according to some characteristic common ending, *e.g.* **am** or **at**. This *ending* is taught by the "Look-and-Say" method. To this certain consonants are prefixed to form words. The Phonic method is employed to teach the power of these consonants, *e.g.*

f-an, m-an, p-an, r-an, v-an,
f-at, m-at, p-at, r-at, s-at.

By a very careful classification of the combinations of letters most frequently occurring in words, rapid progress is secured. Illustrations of teaching by this method will be given in subsequent pages.

10. The Alphabet.—Except where a synthetic method is adopted, a knowledge of the alphabet before teaching to read is quite unnecessary; yet a very large proportion of teachers, from the force of custom, still continue to burden the little ones with an exercise in which, even when taught by kindergarten occupations, they cannot possibly feel a sustained interest.

Whatever system of teaching to read you choose to adopt, do not under any circumstances attempt to teach the *whole* of the letters either of the capital or small alphabet, much less of both, before teaching words. Such a course is unnecessary; it disgusts the little ones, and gives them a distaste for reading; and this on the threshold of the subject. No worse course could be pursued.

Teach a few letters, and combine these into little words. The children then see the use of acquiring the powers or names of the letters—it is a step to words which they understand. They are therefore interested, and are ready to learn another group of letters when the time arrives.

Many plans for teaching the letters have been suggested and tried. Each has its special advantages, and all are said to be more or less successful. But it must be remembered that often an inferior plan is successful, because it is one which the teacher feels herself specially competent to carry out. The credit is due to the teacher more than to the plan; she often triumphs in spite of her method. The teacher should therefore carefully consider which method she feels herself most capable of teaching.

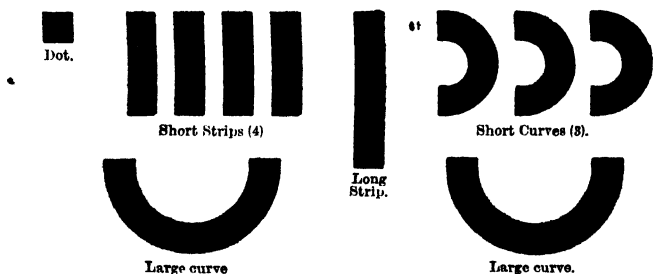
The following are some of the best known:—

(1) **Weary repetition, letter by letter, from the Alphabet Card.**—This was once the common plan, and is sometimes even now met with. It is mentioned here only to put young teachers on their guard against adopting it. The drudgery of such a task to the little ones can scarcely be realized by the teacher.

(2) **The Kindergarten Method.**—Various occupations have been devised for rendering the learning of the alphabet less tedious. In all of them the object is to press hand and eye, as well as ear, into the service, and to make them mutually helpful. Some of these are:—

(a) *The Kindergarten Alphabet Box.*—In this box are a number of strips of cardboard of different lengths and colours, and also a number of semicircles in the same colours. Under the teacher's guidance, the children construct out of these the letters of the alphabet. The letters are taught in groups according to their formation. The capitals are more easily formed; but since words are printed in small letters, if the teacher is prepared to follow the plan recommended above, and teach *words* after each group of letters, she will find it advantageous to start with the small letters.

Small Letters.—The whole alphabet can be constructed out of the following eleven pieces:—



Arranged according to their formation, they may be taught in the following groups:—

- Group 1.** O (two small curves).
 C S („ „ „ and dot).
 a (three small curves and one short strip).
 e (c with short strip).

Words, so; as.

Though not quite so easy of formation as some of the letters which follow, the "a" and "e" are taken here, so that more words may be formed at each stage.

Group 2. b d p q (long strip and small curve).

Words, do; bed; sob; cob; pod; bad; sad; pad, &c.

Group 3. x v w z (small strips).

Words, we; vex; box; wax; sow; bow; wed, &c.

Group 4. y (two short strips and curve). Compare with **v**.

k (one long strip and two short).

i (small strip and dot).

j (long strip, dot, and small curve).

Words, is; bid; kid; job; yes, &c.

Group 5. n m. (small strips and curves).

r (small strip, curve, and dot).

Words, rob; mob; ned; red; rod; nod; rid; mid, &c.

Group 6. h f t (one long strip, one small curve, one short strip).

Words, hot; hat; fat; hit; fit; fed; ted, &c.

As the number of the letters learnt increases, some attempt at word-building on a definite system may be made in the words taught.

The words should be taught through a picture-story lesson into which they are introduced.

The elder children of the class will probably be able to trace round the strips as they lie on the slate. This is a good exercise.

Capital Letters.—First teach those which are like the small letters.

Group 1. O, C, S, X, V, W, Z. These should be at once recognized.

Group 2. Now select those formed by vertical and horizontal lines—I, T, L, F, E, H.

Group 3. The vertical and oblique line may now be taken—A, N, M, K.

Group 4. The curve may next be introduced—D, P, B, R.

Group 5. Teach the remaining letters—

J (formed from I); U (from J);

G (from C); Q (from O);

Y (from small v).

Where a letter bears a real resemblance to some known object it is advisable to associate the two, *e.g.* O with orange; Y with wine-glass, &c.

The above analysis of the letters of the alphabet takes advantage of the similarity of or contrast between the different letters, as well as their usefulness in forming words at an early stage. But to a teacher who intended adopting the phonic method in its entirety the chief consideration would be, not the similarity of the *form* of the letters, but the similarity of *sound*; the way in which the sounds are produced. Such a teacher would probably adopt a classification somewhat as follows:—

Group 1. Vowels, a, e, i, o, u.

„ 2. Labials (lip sounds), p, b, v, f, m, w.

„ 3. Dentals (teeth sounds), d, t, th, n.

„ 4. Palatals (palate sounds), j, ch, y, sh, r.

„ 5. Gutturals (throat sounds), k, hard c, q, g, ng, h.

„ 6. Sibilants (hissing sounds), s, soft c, z, l.

(b) *Sticks and Rings.*—The sticks of the Eighth Gift are frequently used for making the letters of the alphabet which are composed of straight lines, whilst those which require the curve only are formed by the rings of the Ninth Gift; the remainder are formed by a combination of sticks and rings.

(c) *Writing in Sand*.—Forming the letters in sand placed on a slate is successfully adopted by some teachers.

(d) *Drawing*.—Imitating the teacher's drawing on the black-board is another way of acquiring the alphabet. The teacher simplifies the form of the letter as much as possible, drawing it on the squared lines of the kindergarten black-board, and the children copy on the kindergarten slate.

(e) *Wet Threads*.—A wet thread is given to each child, and placed on its slate; this the child twists into the form of the letter required.

(3) *The Word Method*.—This is probably the best, quickest, and most interesting method of acquiring the names or powers of the letters of the alphabet.

The teacher makes a selection of objects, the names of which contain all the letters of the alphabet. Mr. Livesey gives the following list—**box, jug, can, vest, drum, whip, key, quill, fry**. Many other similar lists may be made.

The object itself is shown, and a story told with respect to it, so as to arouse and maintain the interest of the children. A picture of the object is then shown and recognized. The word is now introduced and associated with the picture. This word is very clearly pronounced by the children, and the eye is made familiar with its appearance as a whole by requiring the children to pick out the word from reading-sheets, &c.

The children are now supplied with the letters which form the word, and simply by imitating the teacher they arrange the letters to form the word required.

The children now see that the word is made up of parts, and their curiosity is stimulated to know the name for each part. The teacher takes up the first letter, pronouncing either its name or its sound, and the children imitate the action. Each letter is treated in the same way.

For several lessons the same word is taken, but the teacher tells a *different* story to maintain interest. When the children can all hold up any letter asked for, the teacher names certain letters, and requires the children to point them out in the reading-sheets. In this way all the letters of the nine words are acquired.

Each letter is associated in the child's mind with an object in which its interest has been thoroughly aroused by pleasant stories. The letters which form the individual word are also

closely associated by the impression the word, as a whole, has left on the child's mind; the one helps to recall the other.

11. Distinctness of Utterance.—This is the first essential point of good reading. The infant teacher has to teach children to *read* clearly; but she must first teach them to *speak* clearly: hence the great value in the hands of a vigilant teacher of the conversational lessons, the recitations, picture stories, &c., which form such a large part of the daily work of the babies' class in a good school. These little ones are being trained to observe, and are helped to express in words clearly pronounced, what they observe. This is the best possible preparation for the reading lesson proper.

Errors seem to dwell in the mind more tenaciously than truths; therefore it is of the utmost importance in speech, as well as in other things, that the foundation should be well and truly laid.

Two points require the teacher's constant attention in order to secure distinctness of utterance—

(1) **Articulation**, that is, the proper position of the vocal organs—the tongue, teeth, lips, &c.—in order to produce the required sound; and

(2) **Enunciation**, that is, the giving forth of the sound.

The above terms are variously used by different writers; and frequently by **good articulation** is meant what is comprised in both of the above, viz. the production of every sound clearly, fully, and distinctly.

At this early age the vocal organs are very flexible and easily trained. All that is needed is for the teacher to thoroughly know how the tongue, teeth, &c., should be placed in order to produce a given sound; to possess a clear voice for producing the sound; to have a quick ear to detect inaccuracies, and a quick eye to ensure that all are imitating her. Her manner should be bright, sympathetic, and encouraging; and above all she must be patient.

Young teachers will find much useful information on the way to produce the different sounds in Peile's *Philology*, one of Macmillan's Literature Primers.

12. A First Reading Lesson.—Let us remember that the teacher's object is to make children love reading; so that when they leave school they will regard books as treasured friends. The reading lessons of the infant school will do much

either to implant this feeling or to create an aversion to the subject. However many the difficulties to be overcome, the teacher must do her utmost to make the reading lesson a pleasure to the little ones; this is an evidence of her skill.

Reading requires **close observation of words**, for on this depends their quick recognition. But a list of words, however carefully graded in regard to difficulties, has no interest as such to the children. •

How shall we arouse the necessary interest? Every teacher of infants knows with what rapt attention little ones will sit and closely observe every point of a picture about which the teacher is telling some interesting little story. She knows, too, how every detail of a picture thus described is impressed on the memory; with what eagerness and zest they enter into the story, and are proud to answer questions with respect to it.

The **Picture Story**, then, is a good fairy we may well press into our service in teaching our little ones to read. The teacher who can skilfully introduce into her story, *in close connection with the representation of the thing or the action*, the sign (word) for the thing or action, has advanced far towards getting that sign and its sound recognized and remembered. The thing and its sign are so closely associated in the child's mind that one recalls the other.

But if children are quickly to recognize and pronounce words, these words must stand for things with which they are familiar; and, moreover, they themselves must be accustomed to use them. The picture-story lesson, therefore, should be **conversational**, so that the children may have grown accustomed to the use of the word before the sign for it is introduced.

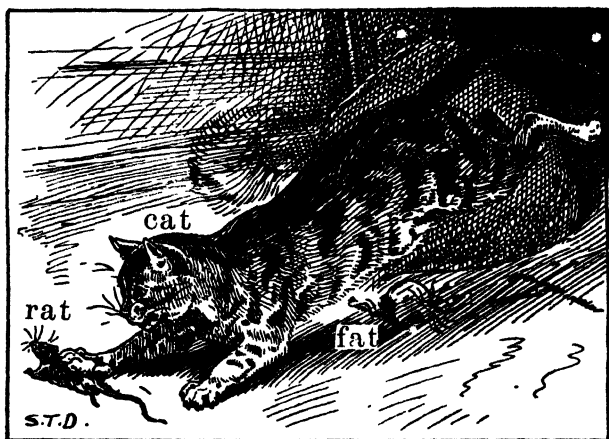
Whenever possible, the object lesson should be made to help the reading lesson by familiarizing the children with the use of the words to be taught. Thus if we intend to teach the word **cat**, the way should be prepared by making the preceding lesson an object lesson on the cat.

Not only should the words be **familiar**, they should of course be of **regular notation**, so that one word is a stepping-stone to the next.

1 OUTLINE OF
A CONVERSATIONAL PICTURE-STORY LESSON.

METHOD A.

Words to be taught, cat, rat, fat.



13. *First Step*—The words introduced.

The teacher refers to the object lesson on the cat, and draws from the children that the cat is the children's pet; that she is loving and gentle, and fond of being nursed and stroked, showing her pleasure by the purring sound she makes.

She then introduces the picture, *covering the rat with her hand*, and commences to engage the children in conversation somewhat after the following manner:—

(a) Word *cat*.

Teacher. "Here is a picture in which you can all see the cat. Come here, Charlie, and point out the cat. What is this, children?"

Children. "It is a cat."

T. "I don't think this cat looks very gentle. She looks to me more like the wild cats I told you of. Look at her mouth. What can you see?"

C. "The cat's mouth is open."

T. "Yes; her mouth is open; and I can see her sharp teeth. She looks as if she were ready to bite.

"Now look at her eyes: they do not look like the cat's eyes generally do. She seems very angry, and her eyes look fierce. Say after me—"

C. "The cat's eyes look fierce."

T. "Then look at her paws. They do not look like the cat's paws, do when we are stroking and petting her. What can you see?"

C. "The cat has her claws out."

T. "Quite right. And when does the cat put out her claws?"

C. "When the cat is angry."

T. "Yes; Charlie knows that, for the cat scratched him when he was a naughty boy and pulled her tail.

"But the cat does something else with her claws besides scratching. What else does she do with her claws?"

C. "The cat holds things with her claws."

T. "That is right. But look at her hind legs. What is the cat doing?"

C. "The cat is jumping."

T. "Yes. This cat is jumping or springing on something. Her mouth is open, her eyes look fierce, and her claws are stretched out: she looks fierce and angry, not at all like our gentle cat. But it must be a cat, for here is this little word" [*pointing to word 'cat'*] "which tells me so. This is the word 'cat'. Say after me—'cat'. Now again—'cat'." [*Teacher has this word pronounced collectively and individually.*]

T. "Now, Charlie, show me the picture of the cat" [*child points*], "and now show me the word cat."

(b) Word rat.

T. "We said the cat was springing on something, and that she was holding it with her paw. What is it she is holding?" [*Teacher removes her hand from the picture of the rat.*]

C. "It is a rat." •

T. "Quite right. But what else does the cat catch?"

C. "The cat catches mice."

T. "So she does. And if it were not for a little word here" [*teacher points to 'rat'*] "I should not know whether this was a large mouse or a small rat. This little word is the word rat. All say after me—'rat'." [*Repeat the word collectively and individually.*]

T. "Now, Charlie, point to the *picture* of the 'rat' [child points], "and now to the *word* rat."

(c) Word **fat**.

T. "Now we see why the cat looks so fierce, and why she has her mouth open.

"What does the cat do with the mice and rats she catches?"

C. "The cat eats them."

T. "Yes. And when I look at this cat I think she 'must have eaten a good many rats or something else. She does not look very thin. How do you think the cat looks?"

C. "The cat looks fat."

T. "So she does. And here is the word **fat**. Say after me—'fat'." [*Repeat the word collectively and individually.*]

Note (1) The questions are so framed that the child has to use the words we wish to impress, as often as possible.

(2) It is not supposed that the children will themselves frame the sentences as they are here given, at any rate in the early stages. What the teacher has to do is to take the child's answer and to help it to form the complete sentence, which all will collectively repeat after the teacher.

Second Step—**The words impressed.**

The teacher should now make sure that the words can be distinguished by adopting some of the following exercises:—

(a) Narrating a little story in which the words taught are introduced, and requiring a child directly it hears one of the words used, to point to it on the sheet.

(b) Giving each child the letters required, and then briefly narrating the story. As each word is introduced, the child is to form the word with its letters **by imitating the teacher**, e.g. the teacher holds up letter **c** and the children imitate; the **c** is then placed on the desk. **a** is treated in the same way and placed beside the **c**, thus **ca**. **t** is now placed in its position—**cat**. [*No name is to be given to the letter.*]

The child then **pronounces** the word **cat**.

(c) The teacher prints one of the words on the black-board, the child points to the *picture* of the thing for which the word stands, and then points to the *word* on the sheets.

(d) The teacher points to the words on different sheets, and the children pronounce them (a) individually, (b) collectively.

Third Step—The words analysed.

The children, by means of letter-boxes, are to form the words as in Second Step (b) thus—

c a t

r a t

f a t

By imitating the teacher, the initial consonant of each word is removed and the children see there is a common ending left. This common ending they pronounce after the teacher.

The teacher then holds up one of the initial consonants, *e.g.* c, and places it before the common ending, at the same time **pronouncing** the word **cat**. The children **imitate** every action and word. Each letter is treated in the same way several times.

The initial consonants are again removed, leaving the common ending. The teacher now shows one of the consonants and places it in position before the class, but **says nothing**. The children imitate the action, but also **pronounce the word**.

In this way the children learn inductively the **powers** of both vowels and consonants.

Any teacher who wishes to teach the **names** of the letters may do so as a supplementary step at this stage.

Fourth Step—Reading sentences.

After a few lessons such as we have described, the teacher should teach a few common words and phrases which enable sentences to be made. These should be taught by the Look-and-Say method. In this way the children would be taught little phrases, such as **it is**.

The teacher then points to the picture of the cat and says, "What is this?" The children reply, "It is a cat".

These sentences are **printed on the black-board** and read by the children:—

• it is a cat.

it is a rat.

it is a fat cat.

Even at this early stage we urge the teacher to commence the practice of **reading in phrases**. When the teacher points to the picture of the cat and asks, "What is this?" the child naturally groups the words of its little sentence into two parts

with a slight pause between them. When he is asked to read these words, the same natural tone and grouping should be insisted on; so that the child sees that reading and speaking are not two totally different exercises. Printing the sentence in phrases, as we have done above, is a great help to the child.

And here we would like to emphasize the great importance of the teacher of infants being able to print well and quickly. With a little practice it is easily learnt, and will be found a most effective aid in every class of the infant school.

The reading lesson will be still further impressed if in the subsequent Varied Occupation lesson the child is required to prick or trace over the outline of a cat or rat, with the word **cat** or **rat** placed beneath it.

When it is possible, the object illustrating the word taught may be represented by sticks or rings.

In the subsequent writing lesson the words **cat**, **rat**, and **fat** should be chosen for the copy. If the class is fairly advanced in writing, the sentence "It is a cat" might be written by the forward children.

METHOD B.

14. There is another method, the leading principle of which—the teaching of *words first* by means of picture stories, and *afterwards analysing them* and sounding their parts—is the same as that adopted in the lesson just given; but instead of the words having a *common ending*, e.g. cat, rat, fat, they are chosen with the *same terminal and initial consonant*, and the five vowels are represented in the five different words, e.g. *pat, pet, pit, pot, put; hat, (het), hit, hot, hut*.

The children make the words with the word-building box; and on examining them **p** is found to be common to them all. This part is removed, and the endings **at, et, it, ot, ut** are recognized and pronounced. These five endings are available for use with any consonant prefixed, and thus a large number of words are easily and quickly learnt.

When the endings are recognized and sounded at sight, the **p** is again prefixed to each, and the words thus formed are sounded. As the *same consonant* is prefixed to each ending the child thoroughly acquires the **power** of that letter, its attention being directed to the *one* letter only; this is a great advantage.

In this system not only are *words* taught, but *syllables* also. Thus in teaching the **power** of **h** the words **hat, hit, hot, hut**

CONVERSATIONAL LESSON.



pat



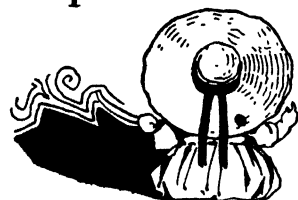
pet



pit



pot



hat



hit



hot



hut

The above illustration shows how the words would be taught as wholes, as in Method A.

are first introduced by the story method; but when they are analysed the ending *et* is also introduced, as it is already known. When the words are again reconstructed the *h* is prefixed to all five endings and the words and syllables sounded.

These syllables are easily acquired, as the *ending is known* already and the *common initial consonant* prefixed is also known. The syllables thus acquired are found to be of the greatest service at a later stage, as they are at once recognized when they form a part of a dissyllable.

All the words and syllables which can be formed from the endings *at, et, it, ot, ut* are first taught; then another ending is introduced, *e.g. ad, ed, id, od, ud*. By the time this new ending is needed the children have acquired a real grasp of the power of each letter prefixed.

Only words of regular notation are at first introduced; and the monosyllables of two letters are taught as they are required by the Look-and-Say method. When the words are recognized they are formed into sentences, as in Method A.

Experience has shown that where the exercises are carefully graduated, the children taught on either of these methods make rapid progress, because from the first their interest and attention are secured and they see the use of what they are doing, and feel conscious of power acquired.

We have treated of these introductory lessons at some length, because we are anxious that from the first the reading lessons should be looked forward to with pleasure by the little ones.

15. Natural Expression.—We have in a preceding paragraph (12) p. 94, insisted on the importance of this; we wish to put the young teacher on her guard against allowing the children to *shout* out the words either collectively or individually, at the same time pitching the voice too high. On the other hand she must equally guard against a drawling, sing-song style, with the voice pitched too low. The children must be early taught that *reading is speaking*; the Conversational Picture Lesson will enable the teacher to do this, if, as we have advised, the children first *answer* a question from the picture, and then *read* their answer.

Children are good imitators, and as a rule have a quick ear for sound; the teacher's pattern is, therefore, all important.

Recitations based on the subject of the reading lesson, delivered naturally and with appropriate action, are also a valuable aid to securing a natural style of delivery.

16. Reading Sheets.—We advise the use of these as a supplement to the reading from the black-board, and as affording a rapid means of revision. The reader will therefore see that we do not consider the Sheets should be used for *teaching* the words; all the words which occur on the Sheets should have been taught in the way previously described, and the words should have been picked out from them.

The use of Sheets, however, marks another stage in the advance towards the primer; for the child is for the first time called upon to read sentences printed in *black* letters on a *white* ground, whereas he has hitherto been accustomed to read *white* letters on a *black* ground. This should be the only new difficulty presented.

The chief points for the teacher to attend to are **quick recognition of the signs, clear articulation, a natural tone, and grouping the words into little phrases.**

The latter is a difficulty which must be faced and surmounted. It is found to be a great help (unless the sentences are printed so as to mark the phrases) to show the phrases, when reading the Sheets for the first time, by means of a pencil mark, thus—

The dog | sits | on the hay.

These marks can be obliterated when reading the Sheets for the second time.

Give the child plenty of time to master the words of the phrase before expecting it to pronounce any of the words. Do not be slow to show your appreciation of real effort, and you will find in a short time marked progress.

See that there is **sense** in what is read. Can you wonder that little ones become listless and inattentive when required for twenty minutes to read such combinations as—"I am on"; "Am I on?" "Go on"; &c.?

Do not neglect to spend a few minutes at the *end of each lesson* in *word-analysis*, to teach or revise the names or powers of some of the letters which form the words; such revision is important. It should be carried out by the help of the word-building boxes.

17. The First Primer.—This is an important stage. Mr. Sharpe, H.M.I., says—"In the best infant schools it is felt that nothing is gained by the premature use of books".

Two new difficulties are here presented—the child is called upon to read from much smaller type, and, what is more difficult, he is required “to keep the place”.

The difficulty of introducing a primer is much lessened if the Sheets previously used correspond to the first lessons contained in the primer; the child can then give his whole attention to the mechanical difficulties above named.

The teacher must see that the books are properly held in the outstretched palm of the left hand, and at the proper distance from the eyes. At this stage the children should be allowed to **point**, but not with the finger; little wooden pointers are sold specially for this purpose, and their cost is more than saved in the greater length of time the books last.

“Pointing” helps the child to follow the words read, and also enables the teacher to see if the place is kept. It fixes the child’s attention on the particular word, and ensures that the proper word is being observed when its sound is pronounced by another member of the class. Great watchfulness on the part of the teacher is necessary; for if the child is pointing to one word and a totally different word is being pronounced, positive harm is being done.

But “pointing” has its disadvantage; it helps to restrict the child’s attention to the one word, and so interferes with proper phrasing. It should, therefore, be discarded as soon as it can be done without.

The words of the First Primer should be confined to the **short vowel sounds**, since these are chiefly found in the commonest monosyllables, and they are more regular in notation. The two-letter words containing the long vowel sounds will of course need to be used in order to make the sentences complete.

18. The Second Primer.—In this book the **long vowel sounds** are introduced and taught; but those of irregular notation should be excluded. Regularity and order must still reign in order that the children may advance with confidence.

The black-board must still be used for **teaching** the words. The teacher should carefully prepare the lesson, noting all new words; these will be taught in the way previously advised, making good use of similarity and contrast presented by the words. All the words to be taken during the lesson should be mastered from the black-board before the children attempt to read from the books.

Phrasing and naturalness of tone and style should now receive increased attention.

19. The Infant Reader.—In this book, intended for the use of the upper classes of the Infant School, where the regular short and long vowel sounds have been well mastered, we may with advantage use some of the more common irregular words. These should be introduced gradually, and too many of them should not appear on one page.

A good Infant Reader is characterized by—

(a) **Very careful arrangement and grading of difficulties**, not only of words but also of phraseology. The sentences should be short and their meaning easily grasped.

(b) **Good printing**, not only in regard to size and clearness of type but also to the proper spacing of the words, so that each word stands out clearly and boldly, presenting a well-defined picture.

(c) **Abundance of good illustrations.** Children delight in pictures; they are therefore attracted by a book which ministers to their natural taste. But unless the pictures illustrate the text they are of little value educationally. The picture should excite the imagination and make clear to the child the meaning of the words he is reading. The picture should tell its own story. Too often pictures are introduced simply as an ornament or to fill up space.

(d) **Interesting matter.** We want children to look forward with pleasure to the reading lesson, and for the sake of the enjoyment which it affords, to do their utmost to overcome the mechanical difficulties which the subject presents. This they will not do if the reading matter provided does not appeal to their sympathies. Simple narrative, full of incidents, relating to children's pets, will always attract and command attention, a point of vital importance to success. If the narrative is continued through several lessons, providing the incident dealt with in each lesson is complete, the interest in the reading is intensified. Children are anxious to see what will happen next, and hence look forward with eagerness to the coming lesson.

(e) **Lessons which help to cultivate a natural style of delivery.** Conversational matter should, therefore, be freely introduced as well as exclamations and questions. The children

must be actors in the drama, so that reading becomes to them only another form of speaking. When such matter is provided, Inspectors will no longer need to complain of monotony in reading.

20. How to conduct the Reading Lesson.

The children should stand in the form of three sides of a square, or horse-shoe, so that the teacher can, if necessary, move rapidly from one child to another whilst keeping the whole of the class well in view.

The teacher herself should have previously well prepared the lesson, so that she is prepared to deal with every difficulty to be encountered, and can make the lesson interesting.

The following are the steps in a good reading lesson—

- (a) All the **new** words in the part to be read, which lend themselves to **word-building**, should first be taught from the black-board.
- (b) The **new irregular words** should now be taught from the black-board by Look-and-Say.
- (c) These new words should now be *pointed out* in the book and pronounced.
- (d) The teacher should now *question the children on the picture* and the subject of the lesson in order to arouse interest in the reading matter.
- (e) When this is done, the *teacher reads a sentence phrase by phrase and the children imitate simultaneously.*

The length of the phrase will depend on the progress of the class; three or four words are generally sufficient. In this simultaneous work the teacher must insist on the children paying close attention to what is read, secure clear and good articulation and naturalness of style. She must be on the alert to see that all are *reading*, that is not only pronouncing the words, but following them in the book.

- (f) When the sentence is complete the teacher reads the whole, *exaggerating the pauses* between the phrases.

The children now imitate *collectively*, the teacher insisting on her phrasing being closely observed.

- (g) The *backward section only* should now read the sentence *collectively*.
- (h) Children are now called on *individually* to read the same verse, phrasing and style still being insisted on.

- (i) *Questions are now asked* by the teacher, to answer which the children will be obliged to use the words and phrases just read.

Each verse is treated in the same way until the whole of the passage selected for the lesson has been gone through. A few of the best children may then be called on to read the whole passage. When this is done books should be closed and the children questioned on what they have read.

SUMMARY.

1. Reading is the most important of the elementary subjects.
2. The special work of the infant school is to overcome the mechanical difficulties of connecting sign and sound, and securing distinct utterance.
3. The difficulty of teaching to read is due to the deficiencies of the alphabet.
4. Children's receptivity, good memories, love of pictures, fondness for "doing", and eagerness to learn may all be utilized as aids.
5. The teacher may do much by careful grading of difficulties, frequent revision, arousing interest by stories and pictures as well as by her bright and attractive manner, to lighten the task of learning to read.
6. Pictures, objects, kindergarten occupations, the black-board and word-building frame, &c., are all useful aids.
7. The chief methods of teaching are—
 - (a) The Synthetic (Alphabetic, Phonic, and Phonetic).
 - (b) The Analytic (Look-and-Say and Syllabic).
 - (c) The Combined or Word-building method.
8. The Synthetic methods start with the elements and combine them to form wholes. The Analytic methods start with the recognition of the whole and then examine its parts. The Combined method makes use of the best features of each.
9. Learning the whole alphabet should not precede any reading of words. When learning, hand, eye, and ear should each be made to assist.
10. Good articulation should receive attention at every lesson.
11. The first reading lessons should be by means of Picture Stories aided by the black-board. It is advantageous for the first words taught, to deal with things, so that sign, sound, and idea may be closely associated.
12. Reading Sheets should follow the use of the black-board from which the words should have been taught.
13. The First Primer should be identical with the Reading Sheets, and should teach the short vowel sounds. The long vowel sounds should be taught in the Second Primer.
14. Phrasing and natural expression must be learnt by imitation.
15. The Infant Reader must be well graded, well printed, well illustrated, and thoroughly interesting.
16. Preparation on the part of the teacher is necessary to give a good reading lesson.

GOVERNMENT QUESTIONS. *

1. Explain what is the best use to make in an infants' class of a box of movable letters.
 2. It is said that some children know their reading books almost by heart, and that when examined they are only reciting and not reading. How could you detect this fault, and by what means could you guard against it?
 2. What are the chief difficulties to be encountered in teaching infants to read? Detail the apparatus required for children below seven years of age.
 4. Say what sort of reading lessons you have found most interesting to young children; and describe the way in which you would try to secure distinct articulation.
 5. What do you mean by word-building? Give an outline of a word-building lesson to an infants' class.
 6. Show that a child may be more readily taught to read correctly, if he is first taught to speak correctly; and explain the method in use in your school for teaching the children to speak.
 7. Describe a plan followed in your school in beginning to teach the youngest children to read.
 8. In teaching reading to very young children some teachers begin with the alphabet, and others teach little words first and afterwards call attention to the names of separate letters. Which of these methods do you prefer, and why?
 9. Detail some of the advantages and disadvantages of teaching reading by the "Alphabetic method".
 10. In the following sentence explain the peculiar difficulties presented by the words printed in italics, in the early stage of reading: "*He would take no pains to teach any boy who could not at least write what boys of eight years old can write*".
 11. What should be the next steps in reading after a child has mastered the forms of letters and powers of the vowels? Give examples of a few such lessons.
 12. Explain what you understand by good "articulation" in reading. At what stage in a child's progress ought articulation to have been fairly mastered? What methods of teaching have you found most effective?
 13. To what principal causes do you attribute the low standard of attainment observable in the reading of many elementary schools? State in detail the means you would recommend for improving it.
 14. Show distinctly the advantages to be gained by the use of reading sheets, rather than of books, for the instruction of young children. Describe clearly the manner of using them, so as to obtain these advantages more fully.
 15. State briefly the different steps you have been taught to take in teaching infants to read.
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CHAPTER VIII.—READING (*Continued*).

II.—READING IN THE SENIOR SCHOOL.

I. Three Stages.—The teaching of reading in the Senior School depends very much for its success on the preliminary work done in the infants' classes. Assuming that the children to be taught have undergone the systematic course of training we have endeavoured to outline in the preceding chapter, the work now to be accomplished may be conveniently divided into three stages.

(1) **The Junior Stage**, where the children are from seven to eight years of age. At this stage the children are mainly occupied in overcoming the mechanical difficulties presented by words of irregular notation not already taught in the infant school, as well as the words of regular notation containing two or more syllables. The child's vocabulary is to be extended; he is not only to recognize these new words quickly and to pronounce them accurately, but he is also to be taught their *meaning*, so that he thereby acquires a greater command of language, and therefore greater facility in expressing his thoughts and feelings. Unless the child feels conscious of increased mental power gained by the reading lesson, work at this stage is apt to be irksome. The stimulus resulting from a feeling of power acquired is a great incentive to work even to young children. As long as there are mechanical difficulties to be overcome, every possible device for interesting children in their work should be resorted to.

(2) **The Intermediate Stage**, where children are from nine to ten years of age. The mechanical difficulties are not here so great, though they still need attention. The teacher has now to cultivate greater fluency and ease of expression in the children's reading, and reading with intelligence should be a characteristic feature of the work. The power of expressing accurately in simple language the general meaning of a phrase or sentence read, should be further developed; and the children should be encouraged to tell in their own words, in response to the teacher's questions, the substance of the story read. Such oral composition exercises are a valuable test of the child's grasp of the meaning of what it has read, as well as an important stepping-stone to formal exercises in written composition.

(3) **The Advanced Stage**, where children are from eleven to fourteen years of age. When this stage is reached the mechanical difficulties of reading should no longer be felt. The teacher's aim should be directed towards securing those higher qualities of reading summed up in the term "Expressive Reading".

2. Methods Adapted to the different Stages must vary.—Since the object of the teaching varies so greatly at the different stages, it will be evident that the methods best adapted to carry out the work of each stage will also vary.

In the **lowest stage** the black-board will need to be freely used to teach word-building and the syllabification of words; to overcome the mechanical difficulties of quick recognition and good utterance much simultaneous reading will be done by the class; the teacher will need to be constantly patterning phrases and sentences to show how the words are to be grouped to make sense, and to secure a natural pitch and expression. To obtain plenty of individual practice, reading in sections will often be resorted to.

When the **intermediate stage** is reached, simultaneous reading will still be necessary, but not to so great an extent; longer passages will now be read, more with the object of securing fluency than of overcoming word difficulties. The teacher will pattern longer passages before the children attempt to imitate. Individual reading will occupy a larger proportion of the time devoted to the reading lesson.

In the **highest stage**, where expressive reading is the chief aim, considerable attention will be given to an examination of the passage to be read, so that the structure of the sentences may be made clear, any allusions and figurative language understood, and the proper pauses and emphatic words necessary to bring out the sense discovered. The teacher's pattern reading will still be needed to demonstrate how, by suitable modulation of the voice, by pause and emphasis, the reader may stir in his hearers the same feelings of pride, envy, hatred, joy, sorrow, remorse, &c., which swelled the heart of the writer. To be successful, the child's reading must be the natural expression of its own feelings; and since the same passage may be variously interpreted by different readers, if the individuality of the child is to have free scope it is evident that simultaneous reading must *not* be resorted to at this stage. Individual reading will claim the larger share of attention.

3. Essentials of Good Reading.—If we listen to a person who reads well, we shall find that his reading is characterized by—

(1) **Good articulation.**—Every sound, syllable, and word is accurately produced and distinctly heard.

(2) **An intelligent interpretation of the sense** of the passage. There is no difficulty in understanding the meaning of what is heard; the words are grouped into phrases and sentences, and pronounced in such a way that their relation to each other and to the whole passage is made so apparent that misapprehension of the meaning is impossible.

(3) **Modulation and Expression.**—These higher arts of reading are the means by which the hearer is put into full possession of the sentiments of the writer. The heart as well as the intellect is stirred.

Good reading can never be produced by an indifferent teacher; the spirit in which the work is undertaken has much to do with its success. Children are quick to observe and imitate. If the teacher come to his work without previous preparation of the lesson, with no enthusiasm for his subject, and with no lofty ideal as the goal to which to point his pupils, interest will vanish and effort will cease with it.

The successful teacher of reading spares no effort by previous preparation to present a perfect model to his class, to remove children's difficulties, to kindle enthusiasm, and to encourage effort; where such teaching is found the children will not only take a delight in the reading lesson but will themselves be good readers.

4. Good Articulation.—To children who have undergone a proper infant-school training, this subject should present little difficulty in the senior school; but teachers will do well to be on their guard lest slovenly habits of pronunciation are acquired.

Purity of utterance depends on the correct production of the *vowel* sounds; variations from the normal cause **provincialisms**. These are difficult to eradicate because of the influence of the home and the street. The difficulty is best overcome by daily repetition, after the teacher's model, of lists of words containing the vowel sounds wrongly pronounced; and also by requiring each word read or spoken to be clearly, distinctly, and accurately produced. Thus both teacher and

scholars need to be constantly on the watch to find out and correct inaccuracies.

Distinctness of utterance depends on the correct rendering of the *consonants*. "*Look after your consonants and forget yourself*" is good advice to the aspiring reader. Certain combinations of consonants present special difficulties; thus many children pronounce the word *acts* as though it were spelled *ac(t)s*, the sound of the "t" being altogether omitted. So the word *minds* is pronounced as though it were *min(d)s*, the "d" being omitted. The *endings* of words require special attention, otherwise final letters are not sounded; thus "loving" is pronounced as "lovin(g)", the final "g" not being sounded.

The omission or misplacement of the **aspirate** is a well-known defect; there are few who are not familiar with "(H)'arry".

This lack of distinctness of pronunciation is sometimes due to a want of proper control over the organs of speech, but in the majority of cases it is due to slovenly habits which have been acquired. Not only are *letters* dropped, but even *syllables* are elided; thus we get "separate" pronounced as "sep'rate", "principle" as "prin'ple", "literary" as "liter'y", &c.

On the other hand, letters are sometimes inserted. The characteristic pronunciation by the London school-boy of "law" as "law(r)" and "garden" as "gardin(g)" is well known; whilst the pronunciation of "umbrell^a" as "umb(e)rella" is no less common.

Sometimes letters get transposed in pronunciation; the common pronunciation of "violet" as "voilet" is an illustration of this.

Another occasion of indistinctness is found when similar sounds occur at the ending of one word and the beginning of the next. These words are run into each other, with the result that the first of the two sounds is omitted. The familiar question, "Wha' time is it?" illustrates this defect.

Another defect somewhat similar to the above is the transference of the final consonant of one word to the first syllable of the next word when this begins with a vowel. The teacher will be familiar with the common phrase "a t'ome" for "at home", which illustrates the point, the aspirate also being dropped.

The only way to overcome these defects is to prepare a list of words in which they occur, and to give daily practice in their pronunciation, under watchful supervision.

In addition to the above, distinctness of utterance is greatly influenced by the **tone** or **pitch** at which the child reads. This will vary in different children; each voice has a tone in which speaking or reading is done with greater ease and less effort than at any other pitch; this is the *natural* pitch of the child's voice, and is the one in which all reading should be done, as it permits of the widest range in the tones of the voice, and thus gives greater scope for expressing by rising or falling inflexions those various emotions which so largely influence the character of the reading.

Experience has shown that the farther the child is removed from the hearer the higher is the pitch at which the reading is done. This, therefore, suggests a remedy for children who read at too low a pitch. Where this is not effectual the teacher may turn to the modulator, and require children to monotone a sentence on the tone he desires. After a little practice the child will read on the required tone.

Loudness has nothing to do with pitch; we may speak with varying degrees of loudness at any pitch. When we wish a child to read more *loudly* we ask it to "speak out"; but when we wish it to read at a higher *pitch* we direct it to "speak up".

Rate or **speed** affects distinctness. Children are very apt to think the faster they read the better is the reading; this the teacher must check.

The **position** of the child is also important. Children should always stand in an easy posture when reading, with head erect and chest well expanded; they should be taught to breathe correctly, to well open the mouth, and to let the sounds be sharp, clear, and crisp.

The following extract well summarizes the characteristic features of good utterance:—"In just articulation the words are not to be hurried over, nor precipitated syllable over syllable, nor, as it were, melted together into a mass of confusion; they should be neither abridged nor prolonged, nor swallowed nor forced, nor, if I may so express myself, shot from the mouth; they should not be trailed or drawled, nor let to slip out carelessly, so as to drop unfinished. They are to be delivered from the lips, as beautiful coins newly issued from the mint, deeply and accurately impressed, perfectly finished, neatly struck by the proper organs, distinct, sharp, in due succession, and of due weight."—*Austin*.

5. Intelligent Reading.—To read intelligently is no easy matter to young children. It requires in its accomplishment—

(1) **Fluency** or facility in reading; that is, such a familiarity with the form of the words met with that the eye instantly recognizes them, and the voice produces them with accuracy and ease. This power is not acquired without much practice. The vocal organs must be well trained and under the reader's control; the eye must be quick to observe; and the memory must be retentive, so that the eye may always travel ahead of the voice to grasp the meaning of what is to follow.

(2) **Quick Appreciation of the Sense.**—There can be no intelligent rendering of a passage unless its meaning is well understood; hence the necessity of a full explanation of the passage *preceding* the child's attempt to read it. In the higher classes the examination of the structure of the sentence by the children is an aid to an intelligent rendering. The child's knowledge of grammatical analysis may be utilized with advantage.

(3) **Power of conveying the Sense of the Passage to the Hearer.**—Through the *eye* the reader is put into possession of the meaning of what he reads; through the *voice* of the reader the hearer must be placed in a like position of advantage.

The punctuation marks indicate to the reader to a greater or less extent the meaning of what he reads; the **pause** and **emphasis** made by the reader will prove of equal service to the hearer.

To bring out the sense of what is read it is necessary that the child should phrase well, that is, group the words spoken in such a way that their relation to each other and to the whole passage may be clearly seen.

The **correct use of the pause** is the chief element in good phrasing. The pauses are indicated to some extent by the punctuation marks; but to read effectively pauses must be made in many other places also, and these depend entirely upon the good taste and judgment of the reader.

The correct use of the pause is a considerable aid to the reader himself; for it gives him time to allow his eye to travel ahead of his voice, so that he may see the words which follow, and grasp their meaning; it also enables him to take in the requisite breath to bring out this meaning effectively.

Phrasing is a difficult matter to young children, but the

time spent in teaching it will be amply repaid by the improvement shown in the reading.

The **correct use of emphasis** is also an important aid to an intelligent rendering of a passage. Children are well aware of the fact that in pronouncing words greater prominence is given to one syllable than to the rest by laying a stress upon it when pronouncing it. For example, in the word "hon'est,y" the first syllable is made emphatic, but in "per,pen,dic'u,lar" the third syllable is the emphatic one. This stress laid on a particular syllable of a word, whereby greater prominence is given to it, is called **accent**.

That some words in a sentence are in the same way made more prominent than others may be similarly demonstrated. Take any sentence spoken by the child, *e.g.* "Did I do my sums **right**, sir?" and, if the lesson which gave rise to the question is an arithmetical one, the child can be made to see that, since it was in doubt as to whether the sum was *right* or *wrong*, it emphasized or laid a greater stress on the word "right" than on any other word, thus giving greater prominence to it.

It will also be seen that the other words were so pronounced as to lead up to this one. It is the centre around which the others are grouped.

An examination of a few other sentences will bring home to the children the fact that in every sentence there is one or more words to which greater prominence is given by a stress being laid on it. This stress on a particular word in a sentence is called **emphasis**.

Children are also familiar with the fact that the meaning of a word may be altered by changing the accent. Thus we say—"Your con'duct is bad"; and "Will you con'duct me to your mother?" By changing the syllable accented we have entirely altered the meaning of the word.

In the same way the meaning of a sentence may be varied by changing the word emphasized. A child having been examined in dictation and arithmetic, on being told that his dictation was incorrect, might ask—"Did I do my **sums** right, sir?" Since the contrast is between dictation and sums, he naturally emphasizes the word "sums", and not "right", in this instance.

Another boy, hearing that Joe Smith has worked his sums correctly, and being anxious to learn whether he himself has been successful, would ask—"Did **I** do my sums right, sir?"

Here the distinction is to be drawn between Joe Smith and the speaker; the word "I" is therefore emphasized in place of "sums" or "right".

By means of a few familiar examples such as these the children will see the great importance of discovering the proper words to emphasize in order to bring out the particular idea which the words are intended to convey. The other words of the sentence will be so pronounced as to lead up to the emphatic word, and give it prominence.

Whatever device will give prominence to a particular word or words produces emphasis. In writing we give greater prominence to words by placing them at the beginning or ends of sentences, or by removing them from their usual positions. In reading the order of the words is fixed, and we must depend in great measure for emphasis upon the two great factors—*pause* and *stress*.

Emphasis may also be produced by varying the rate at which the words are pronounced, by inflecting the voice, or by pronouncing the word at a higher or lower pitch.

Whenever there is a contrast implied or expressed the word must be emphasized.

Since correct emphasis depends entirely upon a thorough grasp of the meaning of what is read, it is a good test of intelligent understanding.

6. Reading with Expression.—The advice "Read as you would speak" is commonly given; but this is extremely difficult both to children and adults, for in this advice is implied the highest arts of reading.

Listen to the words of a brave little school-boy stirred to anger through the ill-treatment of his companion by some big cowardly fellow. Note the vehemence with which the words are uttered, the suppressed emotion which they indicate. Watch how the voice is inflected, how words are emphasized and pauses made. The most accomplished reader could not pronounce the sentences more expressively.

Narrate a similar scene, and present it to the same child to read, and the result will be greatly inferior. Why is this? Simply because the child's *feelings* have not been stirred to the same extent. In the first case the words were the natural expression of what the child *felt*; they were the outward expression of the emotions which were raging within, and hence were intensely expressive. But in the second case this

intense feeling was wanting; the child gave utterance to the words without being stirred by the feelings of which they were the expression; hence the performance was tame and expressionless.

There can be no true expression without feeling. To read with expression is to read with feeling. The reader must lose his own personality and become an actor in the scene depicted. Then, and not till then, will the thoughts and feelings which stirred the writer be presented in all their force to the reader's hearers. This constitutes *expressive* reading.

Envy, hatred, malice, remorse, despondency, expectancy, hope, joy, &c., may all be expressed by the marvellous modulation of which the voice is capable; but to expect such perfection from young readers is out of the question.

Before a child can *read* expressively it must be taught to *speech* expressively; hence teachers who are most successful in teaching reading maintain a careful watch over the ordinary speech of their scholars. Clear, distinct, and expressive utterance is demanded throughout the day in every question asked or answer given; thus good habits are formed, which have an appreciable effect on the quality of the reading.

In such schools it is also the custom frequently to require children to narrate to the class any striking incident which has come under their notice, *e.g.* a street accident, or any act of bravery witnessed. Such exercises are an invaluable aid to expressive reading.

Reciting, after full explanation, simple emotional poetry which appeals strongly to the child's sympathies, will do much to cultivate an expressive style of delivery.

Another useful aid to progress is provided when the teacher occasionally sets apart a lesson for reading to the class in his best style, interesting narratives which give scope for the portrayal of the various emotions. Children may also be invited to bring to school any narrative which they think especially interesting, and, after submitting it to the teacher for his approval, read it aloud to the class.

Rules for reading with expression are useless to young children, but the teacher may do much to secure the expressive reading of a passage by—

(1) Rousing the children's interest in what they are to read. This he will do by narrating the story in as striking a manner

as possible, endeavouring to put his hearers in full sympathy with the thoughts expressed by the writer. All difficulties of phrase, word, or allusion will be carefully explained, so that the children thoroughly comprehend the meaning of the language employed.

(2) Going carefully through the passage, questioning the children on the proper places for the pauses to be made and the words to be emphasized, and showing the reason for each.

(3) Showing by practical demonstration the different modulations of the voice necessary to bring out the various emotions and shades of meaning which the words are intended to convey.

7. Aids to Good Reading.—The following points all have an important bearing on the success of the reading lesson:—

(1) **Suitable Posture.**—The reading lesson is best conducted standing. The children should stand erect, but in an easy attitude. The book should be held from 12 to 15 inches from the eyes, and in such a position that the face of the reader is in full view. If children sit during the reading lesson the child called on to read should always stand.

(2) **Form of the Class.**—Each child's face must be well in view of the teacher, and, on the other hand, the teacher must be able to be seen by all the children. When the class is arranged in horse-shoe form, in three sides of a square, or in parallel rows, this condition is fulfilled.

(3) **Good Print and Light.**—The size of the printed letters is an important consideration, but not so important as clearness of type and well-spaced words and letters. Every precaution should be taken to protect the children's eyesight, and therefore in addition to providing well-printed books the teacher should see that the children stand in a suitable light for reading. Too much light is as bad as too little. The light should never fall directly on the book.

(4) **Suitable Reading Matter.**—The reading matter provided should be adapted to the children's present state of mental development, and be of such a character as to arouse interest, stimulate thought, and extend knowledge.

(5) **The Teacher's Pattern.**

(6) **The Teacher's Explanation.**

(7) **The Teacher's Correction.**

(8) **Simultaneous Reading.**

(9) **Reading in Sections.**

(10) **Individual Reading.**

We will now proceed to discuss these latter points in some detail.

8. The Teacher's Pattern.—This is of paramount importance. A good reader is not necessarily a good teacher of reading, for much skill is required in the conduct of the lesson. But, other things being equal, experience shows that the more accomplished and refined the teacher is as a reader, the higher is the standard reached by his pupils.

Pattern reading must form a part of every lesson, whether given to a junior or senior class; it is therefore an art which should be carefully and systematically cultivated by young teachers. Nothing can be done without practice; and this will improve even the best of readers. It is to be feared that young teachers do not sufficiently recognize the importance of this subject, nor the immense influence for good or ill their own reading exerts upon the children of the class.

The teacher's pattern should present a perfect model for the children's imitation. This the teacher will not be able to give without previous self-preparation.

The lesson should be read through carefully, so that the teacher may be acquainted with the substance of it. If the lesson is deficient with regard to matter in any respect, he should prepare the requisite information. Having thus a thorough knowledge of the matter of the lesson, he will be able to devote the whole of his attention to the reading of the children. To be free from the necessity of keeping one's eyes constantly on the book is a great advantage to the teacher.

Not only should the young teacher prepare the subject matter of the lesson, but he should also go carefully through the passages, marking off the proper phrases and emphatic words. This will prevent him giving a different rendering of the passage when it is again read; such different renderings always cause confusion in the children's minds, and result in imperfect efforts on their part.

He should anticipate difficulties which are likely to arise during the course of the lesson, and decide on the best way of removing them by means of his own pattern.

✓ Pause, emphasis, and modulation should be ~~exaggerated~~; for the children will be sure to fall short of the effect produced by the teacher, and they may by this means reach the required level. Rules for the grouping of words, reasons for pause and emphasis, and instructions for producing a given effect by means of the inflexion of the voice, are useless in the younger classes: all these must be taught by *imitation*; hence the success of the children's efforts depends entirely upon the teacher's model; it represents the goal at which they are to aim. The higher the standard set before them, the higher will the children rise in their efforts to reach it.

The teacher in his preparation must not neglect reading *aloud*; such practice is absolutely necessary if he would read with confidence before his class. The degree of confidence and self-reliance shown by the teacher in his pattern reading will be reproduced proportionately in the children's reading. Confidence stimulates confidence; but the reverse is equally true.

The teacher's pattern should follow the explanation of the words, phrases, and allusions, but precede the children's own efforts. The amount to be read at one time will vary from two or three words to a passage of fair length, according to the degree of proficiency shown by the pupils in reading.

9. **The Teacher's Explanation.**—In criticism lessons on reading, it is a subject of frequent complaint that the greater part of the time is devoted to elaborate explanations and illustrations; but, on the other hand, in the ordinary reading lessons given daily by the teacher to his class, the opposite extreme is more often noticeable, viz. that explanations are almost wholly omitted. The true course to pursue lies between these two extremes.

The teacher must ever bear in mind that reading *practice* is the main point of the lesson. Whatever explanation is given must be *essential* to the full understanding of the matter in hand, and must be given only with just sufficient fulness to enable the class to grasp thoroughly the meaning of what is read. It is essential therefore that the teacher should keep to the point.

If the context itself is sufficient to make the matter intelligible to the children, delay any fuller information you think might be of service till the end of the reading. Since a clear comprehension of what is read is essential to an intelligent rendering of the passage by the children, it follows that the teacher's explanation should *precede* the child's individual effort.

The teacher's pattern reading is often in itself sufficient explanation of difficulties of construction.

Another mistake fatal to the success of a reading lesson is indicated in the following extract from the "Instructions to H.M. Inspectors":—

"It is alleged, and with some justice, that the teaching of reading has been hampered, and the chief purpose of the lesson obscured, by requiring the spelling of difficult words, and elaborate explanations of simple passages. As regards the former, spelling may now with great advantage be entirely separated from the reading lesson, and special lessons on spelling may be given through word-building or simple composition. As regards questions upon the explanation of words and phrases in the reading book, it has already been laid down, and is now emphatically repeated, that, except very sparingly, nothing of the nature of a definition should be asked for; but it should be added that it is difficult for young scholars to give the meaning of a word by a synonym or to paraphrase a passage in simple language, and that it is wiser to test their appreciation of its meaning by offering alternative explanations for their selection, or by asking for simple illustrations."

From what has been stated above it will be seen that we advise simple concise explanations on the part of the teacher, and that he should be satisfied when he perceives that young children have grasped the meaning of the word or phrase, although they may not be able to put their thoughts into words.

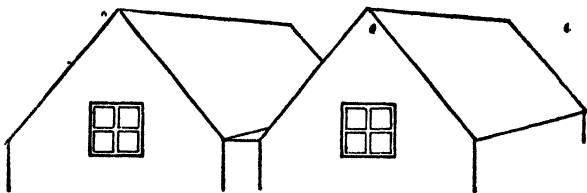
Frequently a rough sketch drawn by means of a few bold lines, or a picture, model, or other visible illustration, conveys clearer ideas than a multitude of words. Suppose the teacher wishes to give his children an idea of locks in a canal, a sketch roughly drawn on the black-board, or a picture shown, will convey the necessary information in one minute far more clearly than an elaborate verbal explanation.

Ability to draw well and rapidly on the black-board with coloured chalks is a power which all teachers should possess; it is a most effective teacher's aid.

An illustrative example is another effective mode of explanation. Suppose we wish young children to understand what is meant by "heroism", the story of Grace Darling's

brave deed will implant the idea far more effectively than any definition.

Comparisons are helpful. We wish to give children an idea of a watershed, and we do so by comparing it to the roof of a house; or of an avalanche, which we compare to a large mass of snow falling from the roof of a house.



Difficult constructions may be made clear to children by rearranging the parts of an inverted sentence, or else by a brief paraphrase.

10. **The Teacher's Correction.**—"Prevention is better than cure"; the good teacher will therefore use all diligence to anticipate errors and prevent their occurrence. This is most essential, for errors seem to cling with a tenacity unknown to truths. But even with the greatest care errors will occur, and it is most important that the young teacher should know how and when to deal with them.

A child will never be able to put forth its best efforts if it is not at its ease. Never let your corrections, therefore, be made querulously, or in an irritative manner; never indulge in sarcastic remarks, or create a laugh at the expense of the reader's efforts. A teacher who does such things will stifle all effort on the part of the pupil, and make him loathe the reading lesson. Above all things, be sympathetic. Let your pupils *feel* that you are conscious of the difficulty of the task they are attempting, that your earnest desire is to aid them to overcome it, and that any effort on their part, however poor in its results, will be sure of recognition.* By so doing you will put your pupils at their ease, and therefore in the most favourable condition for a successful attempt.

The teacher who shouts out "That's wretched. Go on, next boy", is guilty of a fault greater than that of his pupil.

But even where a teacher is thoroughly sympathetic, he sometimes is responsible for the child's partial failure because

he has disconcerted the child by interrupting him to point out trivial errors; or has allowed the other members of the class to thrust out their hands in a body, and in extreme cases to gesticulate, because of some slight error made by the reader.

Except in very important instances, we say, therefore, do not worry the child yourself or allow him to be worried by his class-mates through needless interruptions. Wait till he has finished reading, and then point out the errors yourself, or call on children to do so, if the errors are of such a character that they should have detected them.

Considerable judgment is needed in selecting points for correction. Too often the teacher enumerates so many points of failure, both important and unimportant, that the child is unable to profit by the correction. Such correction does more harm than good, for the child makes its second attempt under a sense of failure, and frequently is less successful than at first.

Where errors are very numerous, we strongly advise the teacher to select the one of greatest importance and give his whole attention to eradicating it, in the meantime omitting all reference to the others. When the first is successfully removed the next may be taken in hand, and so on. Thus, by a gradual process, every error will in turn be attacked; the child, unconscious of the many errors not pointed out by the teacher, is less discouraged, and having his attention directed to the one point only, he boldly and successfully attacks it.

Do not content yourself with pointing out faults, but *show how they are to be corrected*. This is the most important part of the teacher's correction. Explain the nature of the fault, then show its correction. In your pattern you will do well to *exaggerate* the correction, so that the children may grasp thoroughly what you wish to convey.

If the point is one of difficulty, call on some of the best readers in the class first to imitate your pattern. When the backward children see their schoolmates successfully imitate your pattern they will be emboldened to try.

As a rule children's corrections relate to minor points, and are of little value. Allowing children to point out corrections frequently results in loss of time, and in disturbance of the lesson's even course. The teacher may occasionally, if in doubt as to the close attention paid by any scholar, call on such an one to point out some verbal error which the reader has just made. When children know they may be called on

at any time to do this, it helps to keep their attention closely fixed on the matter in hand.

II. Simultaneous Reading.—By this is meant the reading of the passage collectively by the children under the supervision of the teacher. This is a practice very generally followed in the lower classes. It has its advantages and disadvantages.

One great advantage is that it secures a much greater amount of individual practice in reading than can be otherwise obtained. Each member of the class is getting individual practice whilst the simultaneous reading lasts. With backward children such reading practice is most essential.

Simultaneous reading is also a considerable help to a backward section in overcoming mechanical difficulties. They are carried along by the help of the more forward children, and many of the difficulties they would otherwise meet with are removed.

The plan is, undoubtedly, a quick way of conquering faults common to the class generally. All receive practice in imitating the teacher, and in correcting the special points of weakness.

It is also noticeable that when children read collectively, they invariably read at the correct pitch and at a proper rate of speed. The method therefore furnishes a means of correcting children who read at too low a pitch or at too great or too slow a speed; all are bound to go with the general body.

The confidence which results from a combined effort is a great help to the timid, nervous child. Where the lesson is properly conducted, simultaneous reading is always more natural in style than individual reading.

These are advantages of no slight force; but if the teacher would reap them to the full, there are certain points which will require his most careful attention.

In every class there will be children prone to idleness. Unless the teacher be particularly vigilant, such children find a cloak for idleness in the efforts of their fellows. The teacher must therefore take up a position from whence he has all the children in full view.

But the experienced teacher knows that the idle children may be *saying* the words, and yet not *reading*; they are simply pronouncing parrot fashion the words uttered by the others. The teacher must be on the alert to detect this error, or the

results will be disastrous. Requiring children to point to every word said meets the case, as the teacher by a glance can easily detect imposture. But, except with very young children, such a course is not desirable; as it interferes with correct phrasing. It is found quite sufficient to make it a rule that when the teacher approaches a child, he shall at once point to the words being read, and continue to do so till the teacher has passed. Inattention and laziness are thus easily detected.

Perhaps one of the most serious objections is the difficulty of detecting individual faults. Unless the teacher stand close to the particular child suspected, this is impossible.

Where each class is not working in a separate room, simultaneous reading is bound to introduce a disturbing element into the work of the school. An endeavour should be made so to arrange the time-table that the second class is engaged in some copying lesson, *e.g.* transcription.

Two classes should never be allowed to read at the same time in the same room; one tries to drown the other, and the result is that a loud, coarse, sing-song style is acquired. Even when there is but one class reading, unless the teacher be alive to the danger, the same result may be produced.

It is sometimes found that where simultaneous reading is extensively practised, children are timid and nervous when called on to read alone; the sympathy of numbers is lacking.

From what we have said as to the advantages of simultaneous reading, it will be perceived that it is not equally beneficial in all parts of the school; its advantages are confined to the lower and intermediate stages, where mechanical difficulties have to be overcome and intelligent and expressive reading taught by imitation of the teacher's model. In the higher classes, where expressive reading is the great aim, it is inappropriate; for expression, as we have pointed out, depends upon the feelings aroused by the passage within the reader, and no two persons may be exactly similarly affected. Hence if simultaneous work here were the rule, all individuality would be sunk, and a dull, uniform, artificial mode of expression would result.

12. Reading in Sections.—This is another device for securing individual practice in reading. After the simultaneous work, the teacher tests the ability of a few of the best

children to read the passage thus prepared; and, when satisfied of this, from one to three backward children are placed under the charge of each of these forward readers, who are required to hear each child read the portion *just prepared simultaneously*.

Such practice is useful for overcoming mechanical difficulties, and improving the fluency with which children read.

But there are dangers which the teacher must be on the watch to prevent.

Unless the teacher is vigilant, these children sometimes talk to the monitor instead of reading to him. The teacher should therefore be constantly on the move, going from one group to another, remaining a few seconds listening to the reading of each. Unless there is this constant and vigilant supervision by the teacher many mistakes may pass undetected. Even under the most favourable conditions monitors can do little to improve the style of the reading.

13. Silent Reading.—In the “Instructions to H.M. Inspectors” it is stated—“A very useful practice has been adopted in some good schools as an aid to the intelligent use of the art of reading, and it may suggest to you an effective way of varying your methods of inspection. While one class is under examination, a higher class may be set occasionally to read in silence two or three pages of some part of a reading book with which they are not familiar, and at the end of a short interval your questions on the matter of the lesson may enable you to judge how far the scholars have acquired the habit of reading a book by themselves and mastering its contents.” Such an exercise is valuable; for it encourages a child to begin, under supervision, a practice which it is most important he should follow after school-days. It shows him that there is pleasure to be derived from the exercise of the power of reading he has acquired, and teaches him to read both for pleasure and also for the sake of the knowledge which reading brings. The habit of reading is established, as well as the power of concentrated attention necessary for the mastery of the contents of a book.

14. How to keep Attention.—The importance of possessing the power of commanding and maintaining attention during the reading lesson cannot be over-estimated. The following hints may prove of service to young teachers:—

(1) Have your scholars well in view. Either of the forms

previously* suggested will answer the purpose. Keep a watchful eye, and an ear quick to detect sounds.

(2) Prepare your lesson thoroughly, so that you may be free to devote the whole of your attention to your pupils.

(3) Take care to be ready to produce any illustrations necessary for the elucidation of the subject matter, whether they are the articles themselves or models and pictures of them, or black-board sketches. Such illustrations arouse the children's interest, the handmaid of attention.

(4) Be bright, cheerful, sympathetic, and encouraging in voice, look, and gesture.

(5) In individual reading never let there be a succession of bad readers; this quenches the interest of bright and dull children alike. Intermix good and bad.

(6) Arouse a spirit of emulation amongst your scholars. Used with discretion this is an effective means of keeping the attention; but be careful that you do not unduly elate the bright child or depress the backward ones.

(7) Occasionally, when you think a child's attention is flagging, call on him to point out errors made by the reader.

(8) Challenge inattentive children to take up the reading of the passage at the place where you stopped the reader.

(9) Choose suitable books. When the teacher shows a wise discretion in this respect, he has secured for himself the most effective incentive to close attention.

We now proceed to offer a few practical suggestions as to the special work to be done at each stage of progress, and the best means of carrying it out.

READING: JUNIOR STAGE.

15. The Aim of the Lessons.—We have already pointed out (p. 109, 1 (1)) the general aim of the teaching at this stage. Before being advanced to the next stage the child should have conquered all “the mechanical difficulties of reading, which are to be found in the shorter words of irregular spelling”; and “an attempt should be made to teach children to read in a natural tone, and to break up sentences into phrases rather than into single words” (Instructions to H.M.I.). Reading at this stage must show intelligent appreciation of what is read, though verbal explanations of words and phrases which occur may not always be given by the children; for it is quite sufficient if young children show they possess the power

of correctly using such words and phrases in sentences of their own construction.

A fair degree of fluency and ease of expression must be attained; and the reading must be characterized by purity of utterance.

Successful teaching at this stage depends upon the training the children have received in the infant school. Where a teacher finds children have had little or no previous training (owing to special circumstances this is sometimes the case), it is much better to form such children into a preparatory class, and to conduct them through a carefully graded infant reader, rather than to let them try and "pick up" the elements of reading through the ordinary class reading lesson. Children at this age quickly master the preparatory course, and are soon able to join the class and profit by the regular class lesson.

16. Mode of conducting the Lesson:

(1) **Introduction.**—The first thing is to get your children interested in the subject of the lesson, so that they may wish to begin the reading for the pleasure it will afford. Your introductory remarks must be few, but yet sufficient "to whet the appetite" of your children; you will therefore need to carefully prepare this part of the work, that it may be done effectively yet without loss of time.

(2) **New Words and Phrases.**—When preparing the lesson the teacher carefully noted all words and phrases which he thought would prove obstacles to the children. These should be carefully printed on the black-board *before* school commences, so that time may not be wasted in doing this during the lesson. The young teacher should bear in mind that the words are not to be used as *spelling* exercises, for "spelling may now with great advantage be entirely separated from the reading lesson" (Instructions to H.M.I.), but as exercises in *pronunciation*, so that when the words are met with in the reading, they may be recognized and pronounced with fluency and ease. These words should therefore be *pronounced* in syllables clearly and distinctly after the teacher. This should be done before the books are opened, so that when reading commences the continuity of interest may not be broken.

The *meaning* of these new words is generally better given, where necessary, after the teacher's pattern reading; for the context often throws light upon the meaning and makes it more easily grasped by the children. If the explanation of

such words and phrases is necessarily very full, then the teacher should again pattern the passage before calling upon the children to imitate, in order that his model may be fresh in their minds.

(3) **The Teacher's Explanation.**—The teacher should first read the paragraph; for his model often removes difficulties of construction which the children would otherwise experience. Any explanations which are then necessary may be dealt with as previously recommended (p. 120, 9).

(4) **The Teacher's Pattern and the Children's simultaneous Imitation.**—The children have already listened to the teacher whilst he patterned the whole passage; they will now imitate him, phrase by phrase, as he patterns the first sentence. When this is done the teacher will pattern the complete sentence, and the children will then imitate, taking great care to phrase as in the first instance. The verse will be gone through in this way, and when completed, the teacher will pattern the whole, and the children will imitate.

The amount to be patterned at one time depends entirely upon the average ability of the class; it may vary from two words to a short sentence.

It will be noticed that the teacher will be called on to pattern the same passage more than once; it is therefore of the utmost importance that on the second occasion there should be no variation in the phrasing and words emphasized, otherwise confusion will inevitably result. The children are expected to read the passage, observing the same phrasing and emphasis as the teacher did. If there are two patterns, some members of the class will reproduce one and some the other. It therefore behoves the teacher to follow the advice previously given, and to mark his book to show the phrasing and emphatic words thus—

We | who have lived there | know the climate | better.

The book should also show the difficulties of pronunciation or articulation which the teacher anticipates may occur, *e.g.* the omission of the sound of “d” in *minds*; the dropping of the final “g” in *walking*, &c. If such difficulties are marked, the teacher will be on the watch for them, and they will not escape his notice.

For simultaneous work the class should be conveniently arranged in two sections—a forward and a backward one. Before individual reading is attempted, the backward section should be called on to read the passage without the help of the others. This will show if there are any special difficulties which might with advantage be removed by simultaneous work. To encourage this section let one of the best readers of the class occasionally pattern.

(5) **Individual Reading.**—In many schools where simultaneous reading by the *backward section alone* is not resorted to, much valuable time and energy is wasted by commencing individual reading too soon. Because the class collectively could read the passage creditably, it has been assumed that every member had overcome the mechanical difficulties which it presented. This is a mistake; for the weak readers have been carried on by their more forward class-mates, whose reading has covered their deficiencies. When the backward section is called on to read alone, these deficiencies at once become apparent, and it is seen that difficulties are experienced by perhaps a third of the class, and that the simultaneous exercise is the most expeditious way of removing them.

When individual reading is begun, see that the child faces the class as much as possible and speaks in a clear, distinct voice, and with sufficient loudness to be easily heard by the whole class. The teacher who has well prepared the lesson may with advantage listen to the reading with book *closed*; for not knowing exactly what should follow, and his attention not being taken up with his book, he will be in a position to criticise with greater keenness, and to form a better judgment of the intelligence of the reading.

It is the better plan not to read “in turn”, but to challenge certain children to take up the reading. This keeps the attention of the class; for a child never knows when he may be called on to read.

If you wish the *class* to profit by the reading of the individual, never let a number of poor readers follow each other, for in addition to the loss of interest which it causes, there is also a loss of stimulus: a good reader stimulates a poor one who follows, to try and equal his performance.

(6) **The Teacher's Correction.**—In simultaneous work it is better that the correction should immediately follow the error, unless of a very trifling character, for it has been made by the

whole class; but in individual reading interrupt the child only in the most extreme case, or you will disconcert him and spoil his effort; reserve your corrections till the paragraph is finished (p. 122, 10).

(7) **The Teacher's Review.**—When the lesson is finished there should be a masterly review of the whole: to do this effectively the teacher will need previous preparation. This review should be the means not only of testing the children's knowledge of what they have been reading, but also of aiding oral composition.

The teacher is advised not to use set questions sometimes given at the end of the lesson. These are useful in enabling the children to test their own knowledge of the lesson, and as an aid to a written exercise in composition based on the matter of the lesson; but their use by the teacher should be quite unnecessary, and in the eyes of the children is apt to be thought derogatory.

17. Characteristics of Good Reading Books.—"The chief requisites of a school reading book are—

(1) That it should be written in good English.

(2) That its style and contents should be attractive to scholars, and should establish in their minds pleasant associations with the act of reading.

Though the subjects may be properly varied, it is desirable that some of the lessons should form a connected series, and should afford, especially in the higher classes, means of sustaining the interest of the scholars in the most important of the subjects which are dealt with. To the ordinary narratives and poetical and literary extracts there may be added, with great advantage, lessons illustrating and enforcing the importance of thrift and temperance, and the relation of conduct to well-being and to success and usefulness in life. Passages impressing on the children the duty of gentleness and consideration for others, and that of the humane treatment of animals, may also be wisely introduced" (Instructions to H.M.I.).

To the above may be added

(3) That the books in the series must be carefully graded in difficulty.

This is an important point when choosing a book for the

Junior Stage. The difficulty of a book does not depend on the length of the words used: many of the longer words of regular notation are far easier than the irregular monosyllables. The sentences found in it must be short and simple in construction, so that the sense may be at once apparent.

The above remarks apply to school reading-books generally; it now remains to indicate what experience shows will prove "attractive to scholars" from 7 to 9 years of age. Such children are found to welcome with delight narratives relating to child life, *e.g.* The little Hollander stopping the leak in the dyke; stories of animals, *e.g.* The Elephant and the Tailor; fairy tales, *e.g.* Cinderella; and anecdotes and fables, *e.g.* The Wolf and the Lamb.

With such matter and a good teacher there will be no lack of interest.

READING: INTERMEDIATE STAGE.

18. The Aim of the Lessons.—Intelligent reading is the great aim of the teacher at this stage. The structure of sentences will be studied in a simple manner, to show the relation of phrases and clauses to the words on which they depend. This will teach the children the principles of phrasing and make them independent of the teacher's pattern; it will also aid them so to pronounce the words as to bring out the meaning with greater effect.

Since mechanical difficulties encountered are now far less numerous, greater fluency and ease of expression should be demanded.

Not only should the reading show that the meaning of the passage is grasped by the reader, but there should also be an attempt to teach the elements of style. The style should be a natural one, and varied so as to be in harmony with the matter of the lesson.

Attention should be given to securing the correct pitch of the voice, and children should learn something of its marvellous range of inflection. Emphasis should be more strongly marked, and, in the simpler instances, the reasons for it may be taught.

There is thus ample scope at this stage for the efforts of an earnest teacher.

19. Mode of conducting the Lesson.—The method

outlined in the Junior Stage will, in its general character, be continued here; but the following points may be noted.

(1) **The Teacher's Pattern.**—The amount patterned at one time will now be increased; the sentence should be the unit, and as proficiency is gained, a whole verse may be patterned at one time.

The children's imitation of the teacher's pattern should increase in precision and exactness with regard to pause, emphasis, and modulation. The children may be questioned, and asked to point out the pauses and emphatic words in the teacher's model; and, after a little instruction, the reason for these may be asked in easy examples.

The *elements* of style must be mastered by simultaneous reading. When children have made fair progress in this respect, they should listen attentively to the teacher's pattern, and then a child should be called on to reproduce the passage without simultaneous reading being resorted to.

(2) **The Teacher's Explanation.**—This will be dealt with in greater detail. Allusions will be more fully explained to arouse an interest in general knowledge and to encourage children to read for their own pleasure and information. The teacher himself will supply less explanation; his aim will be by careful questioning to lead the children to discover the meaning for themselves. They will be required to show that they have grasped the meaning by supplying examples and illustrations, or by paraphrasing a word, phrase, or sentence. It will thus be seen that at this stage the children are to do more and the teacher less.

(3) **Individual Reading.**—Greater confidence, fluency, and ease should characterize the individual reading. The pitch of the voice should be well sustained throughout the longer and more involved sentences. Intelligence should be a marked feature, and be indicated by careful phrasing, due emphasis, and a fair degree of expression. At this stage children should show ability to read a passage of moderate length and difficulty, with a fair degree of intelligence and expression, without the teacher's pattern.

(4) **The Teacher's Correction.**—Whilst purity and distinctness of utterance must still be carefully watched and mistakes corrected, the teacher's attention will be chiefly directed to faults of style. Pattern reading, both by the teacher and the

best scholars of the class, will be the means adopted for correcting such errors.

(5) **The Teacher's Review.**—In the junior stages the questions were so framed as to demand small skill in oral composition in order to answer them; now, however, the questions should be of wider scope, and require a sentence of fair length for the answer. The teacher may fairly demand that the answers shall always be given in complete sentences, and be grammatically correct.

20. Books which are Suitable.—The general character of the reading books required has already been pointed out (p. 131); but it will be well to note the character of the reading lessons which experience has shown to prove "attractive" to children.

At this stage some of the lessons should be in series, for the reasons previously stated. Narratives and descriptions of events; moral tales teaching, for example, "gentleness and consideration for others" and "the humane treatment of animals"; deeds of heroism and adventure; striking incidents in the lives of noted persons; wonders of animal and plant life; natural phenomena, &c.,—all these appeal strongly to the feelings and fancy of children at this age, and are read with avidity. What may be called "information lessons", if suitably written, may also be included with advantage to the scholars.

READING: ADVANCED STAGE.

21. Aim of the Lessons.—Before reaching this stage the child has mastered all mechanical difficulties, and can read with intelligence and fair expression any passage placed before him. The teacher should now devote his whole energies to enabling the child to read with true expression (p. 116, 6). Children must be made conscious of the wonderful power of expression they possess, and be shown how this may be produced by inflection of the voice, by variation of pitch, and by pause and emphasis.

Artificiality should be studiously avoided; expression must proceed from feeling; hence the teacher's object will be to arouse in his pupils the feelings which the passage should call forth, to intensify this feeling by his own pattern, and then to leave his pupils to give expression to the feelings which have

been aroused in them. Uniformity should not be aimed at; there should be ample scope allowed for the individuality of the pupil to assert itself; hence simultaneous reading is not a suitable exercise at this stage.

22. Mode of conducting the Lesson.—We have previously called attention to the practice of “Silent Reading” (p. 126), an exercise specially adapted to this stage. Most teachers allow their pupils either to prepare over-night, as a home task, the lesson to be read, or else they allow a certain time to be devoted to silent reading before the lesson commences, so that the children may come to the lesson with a good knowledge of the subject matter.

The teacher then questions them on the lesson, with the object of testing whether they have grasped the ideas contained in it. All figures of speech and allusions are fully dealt with and their meaning made clear. Long and involved sentences have their clauses rearranged to make the meaning clear; and, where necessary, the children are called on to paraphrase such sentences.

Expression is to be the result of feeling arising from intelligent understanding; hence the teacher should, with the class, examine the sentences to determine what pauses should be made and what words emphasized in order to best express the meaning or different shades of meaning. At this stage children should be enabled to give an intelligent reason for the pause and emphasis suggested.

But the teacher's pattern will still remain the most effective means of teaching the higher arts of good reading. His model should make clear to the children depths of meaning which the words did not suggest to them. Rules and reasons are the dry bones which require the teacher's voice to make them live. Here, if anywhere, the most careful preparation on the part of the teacher is absolutely essential.

Since no simultaneous work is to be done, individual reading will occupy the whole of the lesson. The reading practice of each child should be longer and require sustained effort.

23. General Review of the Lesson.—The children are now sufficiently advanced to give in a connected form an outline of the matter of the lesson, different children being called on to take up the story at the stage where the previous child ceased; or certain incidents in the story may be selected

by the teacher, and the children be called on to give a detailed description of each; or they may be asked to give their estimate of the character of one of the persons mentioned in the story, with their reasons for the same.

Another useful form of revision is to require the children to write an essay based on the subject of the lesson.

24. Books which are Suitable.—The aim should be to create a taste for good literature, and to find pleasure in reading some of the masterpieces of the best writers; therefore everything included in the book should be of the highest literary value, and yet should be of such an interesting character as to stimulate in the child the desire to know more of the author's writings. Descriptive passages of scenes and events, narratives of heroic deeds, especially if they arouse feelings of patriotism, are welcomed by children.

In addition there should be "lessons illustrating and enforcing the importance of thrift and temperance, and the relation of conduct to well-being and to success and usefulness in life" (Instructions to H.M.I.).

Most of the lessons should be in series, and each should be of greater length than in the previous stage.

The poetical extracts included should all be written by standard authors, yet well within the range of the children's understanding.

In some schools it is the custom for the teacher occasionally to bring a complete prose work by some good author, and for the children to read it through in class. Such a practice is to be commended.

25. School Libraries.—A good school library should be part of the equipment of every school, for it will cultivate in children the habit of reading for its own sake, give them a taste for wholesome literature, extend their general knowledge, and quicken their intelligence.

The library must contain the best works of authors who are favourites of children—Henty, Manville Fenn, Ballantyne, Hughes, Mrs. Molesworth, Sir Samuel Baker, Cooper, Marryat, Harry Collingwood, and many others. The books must be such as the children will be eager to read, and therefore there must be sufficient variety to provide for the respective tastes of the different sexes, ages, and temperaments. Imaginative literature, "to awaken the sympathies, to quicken the moral sensibilities, and to enlarge the moral vision", must be pro-

vided in abundance for young and old; whilst more solid reading, represented by books of travel and adventure, popular science and history, should be ready to hand when required by the elder children. A library which, in addition to such works as Lamb's *Tales*, *The Vicar of Wakefield*, &c., contains **Fiction**, such as Henty's *Facing Death*, *Redskin and Cow-boy*; Kingston's *Three Midshipmen*; Manville Fenn's *Three Boys*; Ballantyne's *Giant of the North*; Farrar's *Eric*; Ascott Hope's *Seven Wise Scholars*; Mrs. Ewing's *Jackanapes*; Lewis Carroll's *Alice in Wonderland*; Hughes' *Tom Brown's Schooldays*; Kingsley's *Water Babies*; Jules Verne's *Five Weeks in a Balloon*; Miss Yonge's *Daisy Chain*; Cooper's *Deerslayer*, *Pathfinder*; Marryat's *Children of the New Forest*, &c. **Biography**, such as Smiles's *Life of George Stephenson*; Southey's *Life of Nelson*; Butler's *Gordon*, &c. **Travels and Adventures**, such as Sir Samuel Baker's *True Tales for my Grandsons*; Forbes' *Barracks, Bivouacs, and Battles*; Gilmore's *Storm Warriors*; Stanley's *How I found Livingstone*; Anson's *Voyages*; Waterton's *Wanderings*. **Popular Science**, such as C. Kingsley's *Madam How and Lady Why*; Rev. J. S. Wood's *Homes without Hands*; Pouchet's *Universe*; F. Buckland's *Animal Life*; White's *Selborne*, &c.,—will never languish for want of readers.¹

Books of this character will give children such a taste for wholesome literature that the pernicious matter now so often read will no longer attract.

26. Recitation.—This subject is considered of such importance as a means of—

- (1) "Enlarging the range of the scholar's thoughts,
- (2) Cultivating the imagination,
- (3) Improving the taste",

that no school in which it is not successfully taught is considered to reach the highest standard of success.

If the advantages above enumerated are to be realized, great care is necessary in selecting the poems to be taught. Because they are meant for children they need not be childish. A poem which requires no thought does not stimulate the intelligence. "It is well for young children to have their memories stored with poems which do not lose their sweetness and their charm; but, as the mind develops, display a more inward beauty and fresh traits of interest."

¹ See list of *The School and Home Library*, published by Messrs. Blackie & Son, Limited.

The teacher must aim to give his class an intelligent appreciation of the spirit of the poem, and not rest satisfied with an explanation of its verbal difficulties.

The suggestions already made for teaching to read expressively will sufficiently indicate the proper method to be pursued in teaching recitation. We hope no teacher who has read thus far will fall into the error sometimes made by young teachers of allowing the explanation to follow the teaching of the words.

Pupil teachers are sometimes asked to name poems suitable for the different standards; we therefore give a few from the vast store available:—

STANDARD I.—*Father's Return*, Mrs. Alexander; *The Lost Child*, A. P. Graves; *A Night with a Wolf*, Bayard Taylor; *The Sailor Boy*, Tennyson; *Voice of Spring*, Mrs. Hemans.

STANDARD II.—*Battle of Blenheim*, Southey; *The Brook*, Tennyson; *The Children's Hour*, Longfellow; *Daffodils*, Wordsworth; *Homes of England*, Mrs. Hemans; *Hail Britannia*, Thomson.

STANDARD III.—*Barbara Fritchie*, Whittier; *Burial of Sir John Moore*, Wolfe; *Council of Horses*, Gay; *Hohenlinden*, Campbell; *Rain in Summer*, Longfellow; *Fidelity*, Wordsworth.

STANDARD IV.—*Balaclava*, Doyle; *The Armada*, Macaulay; *Lord of Burleigh*, Tennyson; *Paradise and the Peri*, Moore; *Pipes at Lucknow*, Whittier; *Pied Piper of Hamelin*, Browning.

STANDARDS V. AND VI.—*The Ancient Mariner*, Coleridge; *Dora*, Tennyson; *Ivry*, Macaulay; *Mark Antony's Oration*, Shakespeare; *Siege of Corinth*, Byron; *Evangeline*, Longfellow.

SUMMARY.

1. Methods must vary according to the aim of the teaching.
2. The three essentials of good reading are (1) good articulation, (2) intelligent interpretation of the sense, (3) expression.
3. Purity of utterance depends on the correct production of the vowel sounds; distinctness upon the correct rendering of the consonants.
4. Intelligent reading demands (1) fluency, (2) quick appreciation of the sense, (3) power of conveying the sense of the passage to the hearer.
5. Expressive reading excites in the hearers the feelings of the writer; it requires the reader to be in full sympathy with the author.
6. The teacher's pattern must be a correct model for the children's imitation, and therefore needs preparation.
7. The teacher's explanation should be to the point, and should precede the child's effort.

8. The teacher's correction requires sympathy and judgment. It should follow the child's completed attempt.

9. *Simultaneous reading* should be largely used in the Junior Stage, but should gradually diminish in amount till the Advanced Stage is reached, where it should cease.

10. *Reading in sections* is a device for securing more individual practice.

11. *Silent reading* enables the scholars to acquire the habit of reading a book by themselves and mastering its contents.

12. The arrangement of the class, the character of the reading books, the illustrations provided, and the sympathy and alertness of the teacher are important factors in securing attention.

13. In the Junior Stage mechanical difficulties have to be overcome.

14. In the Intermediate Stage intelligent reading is the chief aim.

15. In the Advanced Stage expressive reading is to be the main point.

16. A school library should be part of the equipment of every school.

17. Recitation enlarges the range of the scholar's thoughts, cultivates the imagination, and improves the taste.

GOVERNMENT QUESTIONS.

1. Point out the silent letters in light, height, which, colour, tremble. What are silent letters, and how do you deal with them in Standard I.?

2. In using pattern reading so as to give the correct tone and expression, say whether you would employ it at the beginning or at the end of your reading, and give reasons.

3. Say what sort of reading lessons you have found most interesting to young children, and describe the way in which you would try to secure distinct articulation.

4. It is said that some children know their reading-books almost by heart, and that when examined they are only reciting and not reading. How could you detect this fault, and by what means could you guard against it?

5. It is sometimes complained that children do not read well, because their reading lessons are constantly interrupted by the oral spelling of the more difficult words. Do you consider such interruption necessary, and, if not, how may good spelling be attained without it?

6. What is the best way to arrange a class for a reading lesson so as to secure (a) distinctness of utterance, and (b) readiness on the part of the scholars to observe and correct mistakes?

7. Mention any common faults which a good teacher should avoid in giving lessons in which "pattern reading" is introduced.

8. What is meant by "simultaneous reading"? How should it be conducted, and what is the use of it?

9. What is meant by tone, accent, emphasis, and expression in reading? Say why they need special attention, and how you can best deal with them.

10. What are the chief points to be kept in view in teaching the art of reading? Name the advantages, if any, of exercises in silent reading in school.

11. Describe your own practice in explaining the meanings of words which occur in a reading lesson. Is it better to give needful explanations in the course of the lesson, or to reserve them to the end? Give your reasons, and say whether you prefer dictionary definitions of words, or brief paraphrases of phrases and short sentences; and why?

12. "Old David lived in a hut beside the river. Every year at a certain time a great flood came, and all the rabbits were driven out of their holes by the rising of the river. Then David used to turn with his boat and save the poor things by taking them into it and rowing them up to the higher banks, out of the reach of the water."

In teaching a Second Standard to read the above passage—(a) What words or letters in it are the children in your school liable to mispronounce, and (b) how do you set about correcting them?

CHAPTER IX.—WRITING.

1. Its Importance.—Lord Palmerston has well said "Writing is almost as important as speaking, because every man, whatever his station in life may be, must have constant occasion to convey his thoughts, his wishes, his complaints, his desires, in writing; and, unless that writing be legible and easily read, with the letters well formed, so that a person can read that writing without trouble and delay, it fails by disgusting the person to whom it is addressed".

Its importance to the children attending our Elementary Schools cannot be over-estimated; for to the vast majority it is the necessary passport to employment.

Success in handwriting adds to the credit of the school and the teacher; for it is the one point of school-work which comes prominently under the eye of the parents; frequently it is the one test by which they judge of the efficiency of the instruction given in the school. In the olden days many a school's reputation was made entirely by the handwriting of its pupils.

Even now, an examination of the copy-books throughout a school affords a fair general indication of its efficiency and discipline. Copy-books uniformly well written, show that the discipline is effective, that the children have been trained to observe closely, and that they have been brought up in habits of neatness and cleanliness. Where these are characteristic features, the work can never be wholly unsatisfactory.

2. Essentials of Success.—Writing is a subject which all can learn, since it is essentially a process of mechanical imitation. To ensure success there must be—

(1) *A good model.*—This point will be discussed at a later stage.

(2) *Strict attention to the teacher's explanation;* hence good discipline must be a characteristic feature of the writing lesson.

(3) *A quick eye for form,* so that points of similarity and contrast are at once observed, noted, and remembered.

(4) *Flexibility of the muscles of the hand.*—Practice will soon produce this. The very young child has not at first complete control over its muscles; hence its efforts are not at first successful. Practice gives the necessary power.

(5) *Perseverance.*—The truth of the old proverb "Try again" is in no subject of school instruction more apparent than in writing. Repeated effort invariably results in success.

3. Sloping versus Upright Writing.—For many years sloping writing alone held the field. The slope was formerly much greater than at present. In Mulhauser's System the writing is done at an angle of 60 degrees. Of late years the tendency has been to diminish the slope and to make the writing approach the upright more and more; this is seen in Vere Foster's "Bold Writing" Series.

Writing with a slight slope is more graceful, and is done with greater ease and rapidity.

Perfectly upright writing is difficult to produce; there is always a strong tendency to allow it to degenerate into a slope to the left, a style far from graceful. Another disadvantage is that in continuous writing the loops of one line overlap the tails of the preceding line, causing confusion. In upright figuring 6, 9, and 7 interfere with each other, when in vertical columns, and lead to indistinctness; hence many merchants object to this kind of writing.

4. Characteristics of Good Writing.—Any good writing is characterized by—

(1) **Legibility.**—This is of primary importance. It depends chiefly on—

(a) *A correct proportion being observed between the height and width of letters.*

(b) *The simplicity with which the letters are formed.* A certain amount of flourish may add to the beauty of the writing, but it detracts from its clearness.

(c) *The ellipse forming the foundation of the letters.* Pointed letters are never legible, "n" and "u", &c., are apt to be

made exactly similar. A letter which is too round is lacking in grace.

(d) *Proper spacing of letters and words.* There should be a greater space between different letters than between the parts of letters. This prevents confusing one letter with another, and allows each to stand out boldly and distinctly. This spacing should not be carried to excess, or a straggling appearance is imparted to the writing; the eye has to travel so far before the word is completed, that such writing is very difficult to read.

(e) *Parallelism being maintained between the several letters and words.*

(2) **Grace.**—Writing should be flowing, bold, and free, and the effect should be pleasing to the eye.

(3) **Freedom in production.**—Viewed from the practical standpoint this is of great importance. Since “Time is money”, a quick writer is more valuable than a slow one.

Freedom depends on—

(a) *Each letter being completed without lifting the pen.*

Made in the old-fashioned way the letter *a* required three separate operations ¹*O*²*b*. Written after Vere Foster's model it is completed without lifting the pen *a*

This is a typical letter; many others show equal advantages of the new system over the old.

(b) *The mode of joining allowing the whole word to be completed without lifting the pen.* The saving of time, pointed out above in the formation of the “a”, when considered in relation to the letters forming a fairly long word, is enormous. The word given below, which is written from beginning to end without stopping, would have required 16 separate operations had it been written according to the old style.

encroached

(c) *Short loops above and below the line.* This is also a time-saving device.

(d) *The method of holding the pen.* The pen must be free to glide smoothly and rapidly over the paper.

5. The Chief Defects.—So impressed was the Education Department with the importance of the subject we are considering, that a special *Circular* (362) was issued, calling attention to the most prominent defects observable in the handwriting of Student Teachers, and therefore likely to be intensified in the writing of the scholars. They may be summarized as follows:—

- (1) *Want of uniformity in the thickness of the straight line.*

This is due to an uneven pressure on the pen.

- (2) *Roughness of stroke.*

This results from the same pressure not being applied to each point of the nib. The way in which the pen is held is responsible for this.

- (3) *Letters too tall or too short.*

Children should, in the early stages, have guide-lines by which they may judge the proper relative heights of letters.

- (4) *Links and hooks too thick or too thin.*

The relative thickness between the links and hooks and the down-strokes needs careful teaching. Too often the pen is held more or less at right angles to the direction of the writing, with the above result.

- (5) *Curves wrongly formed.*

This results from a want of proper slope in the straight strokes.

- (6) *Letters not properly spaced.*

Rules for spacing must be carefully taught, as the legibility of the writing is affected by it.

- (7) *Letters not properly combined.*

All possible combinations of letters should receive systematic teaching; some are far more difficult than others, e.g.



- (8) *Want of parallelism.*

This is an almost universal failing. It results from a want of freedom in the movement of the pen, and lack of command over the muscles of the hand.

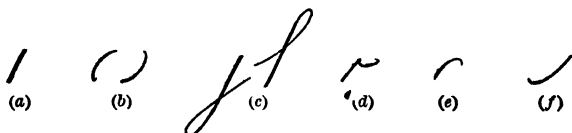
6. Influence of the Teacher's Writing.—The *Circular* above referred to says—"The capacity of teaching handwriting is an essential qualification of any teacher, but a teacher who

is himself a bad writer can never by the most skilful teaching entirely destroy the bad effect of his own example".

"Do as I do" is ever more potent than "Do as I say". A teacher who wishes to produce a certain style of handwriting in his school, must, therefore, perfect himself in the style to be taught. The teacher's pattern is a great stimulus to the child. The copper-plate copy to him is unattainable, but the teacher's pattern represents the standard it is possible to attain; hence the necessity of the model being of sufficient excellence to necessitate continued effort in order to approach its perfection.

7. Three Systems of Teaching.—There are three systems, each of which has its own advocates.

(1) **The Synthetic.**—Under this system the child is first taught the elements which enter into the formation of the letters of the alphabet; when these are learnt they are combined to form letters, and these in turn are joined to form words. The best known synthetic method is Mulhauser's. Mulhauser analysed the letters and found them to be composed of the following elements—



(a) The right line; (b) the curve; (c) the loop; (d) the crotchet; (e) the hook; (f) the link.

The letters of the alphabet were then taught in the following groups according to the elements of which they were composed:—

(a) The right line and lower link,

i u t l

(b) The right line and upper link,

c n m h p

(c) The curve, *c o e*

(d) The combination of the right line, link, and curve,

a d q

(e) The loop,

j g y f

(f) The crotchet,

b r v w

(g) Exceptional letters,

k s x z

To secure proper proportions being observed both between the parts of the letter and between the different letters themselves, and also to obtain due parallelism of the whole, these letters were written in rhomboids formed by horizontal lines and lines sloping at an angle of 60° . Every aid was thus given to the child. The system is undoubtedly very thorough, for it is based on analysis, classification, and synthesis; and exceptional results were produced under Mulhauser's supervision.

But it has fallen more or less into disuse; for in the multitude of subjects now to be taught, the system was found to be too elaborate; the early lessons on the elements lack interest; and the rhomboids led to confusion. It requires an enthusiast to teach it. The system did much, however, to methodise the teaching of writing.

(2) **The Analytic.**—Here the *word* is the basis of teaching. The child is presented with a word traced faintly, and the first writing effort is to trace over this word, until the hand becomes accustomed to the lines and curves which compose it, and can reproduce them accurately. Another word introducing other letters is then treated in the same way. Locke was the chief advocate of this system of teaching, and it is sometimes known as "Locke's Method" of teaching writing.

From the first the interest of the child is secured, as there are tangible results at once produced. Progress in the early stages is rapid; but the system is not sufficiently *thorough* in its attention to details to produce the highest results in later stages. It has, however, suggested a valuable aid to the young beginner.

(3) **The Combined Method.**—Each of the above methods suggested valuable teaching aids. These have been seized and

utilized in the present method, devised and put into practical teaching form by Mr. Vere Foster, whilst what was useless or cumbersome has been discarded.

The chief features of the Combined Method are—

(a) Letters are taught in groups according to the mode of formation.

(b) Guide-lines are used.

(c) Tracing is adopted in the early stages.

This is the method now in general use.

The characteristics of the method are best shown in Vere Foster Copy-Books.

Briefly stated, the *following principles distinguish his system*—

(a) A letter is regarded as part of a word, not as an individual object, and is so formed that a complete word can in the end be written without lifting the pen.

(b) Every letter begins on the base-line with a hair-stroke.

(c) The final hair-stroke is always carried up to the top line, because it is always required in joining letters.

(d) The up-strokes slope more than the down-strokes, as they can thus be more quickly and easily made.

(e) A greater distance is maintained between the letters than between the parts of a letter.

(f) The loops and tails are short, and therefore quickly written.

(g) The general slope of the writing is very slight.

The system shows careful *grading of difficulties*. The letters are taught in groups, and the letters of the first group are combined to form words before another group is introduced, thus lending interest to the work.

Small Letters—

First Group. The stroke and under curve,



Second Group. Upper curve, and combination of upper and under curve,



Third Group. The *a* formation,



Fourth Group.

r r s z

Fifth Group. Long letters,

t d l b h k

Sixth Group. Letters below the line,

p q j y g z f

Capital Letters.—These may be grouped as follows:—

Group 1.

W

Group 2.

J F I

Group 3.

P B R

Group 4.

L D 2

Group 5.

N M

Group 6.

O C E X S

Group 7.

J G Y Z

8. Teaching Apparatus.—

(1) **Desks.**—It is important that these should be of the

right height, so that the children may plant their feet firmly on the ground or ledge provided for the purpose, and that in the act of writing the shoulders may not be thrown up. The desk should slope at an angle of about 15° .

Since the children in the same class vary in height, it is essential that there should be desks of varying heights.

So that the writing may not be in shadow, the desks should be so arranged that the light always falls from the *left*, or from above to the front.

(2) **Black-board.**—This is indispensable to a good writing lesson; it should be used both for teaching and correcting. It should possess a good dull-black surface, and be placed in front or slightly to the right of the class, so that it may be well seen.

The black-board should be *permanently ruled* to correspond with the ruling of the children's books or slates.

(3) **Writing Sheets.**—These large perfect models of writing, used in conjunction with the black-board, are of great service. They should be carefully graded, and show not only the formation of the individual letters but also the correct mode of joining them together.

(4) **Pens and Holders.**—The holder should be large, so that the fingers may be placed on it comfortably without being cramped. The pen-nib should not be too fine, nor should it be too long; otherwise the children's fingers being short, it is impossible to keep them in the correct position on the holder. A difference in the *kind* of nib used causes the child much trouble; change should therefore be avoided.

(5) **Paper.**—Paper of the best quality should be used; it should not be too highly glazed.

(6) **Blotting-paper.**—Too frequently the child is left to *find out* the way in which this should be used, thus occasioning many blots and smudges. From the first, children should be taught to hold the paper firmly with the left hand, and to move the right hand from left to right across the paper *in the one direction only*.

9. **Slate versus Paper.**—It is usual for a child to make its first attempts to write on a slate, but paper possesses superior advantages. In these early efforts *tracing* is a great help; and, with the aid of a graph, when paper is used, this help can be

fully utilized. The use of paper is cleaner than slates, and the surface is better for the eyesight. The lead-pencil is a better introduction to the use of the pen than the slate-pencil is; it requires a lighter touch, and makes a finer mark.

More progress is made, because the child's first efforts are devoted to tracing over *correct* forms, thus accustoming the hand to the right movements for producing the difficult straight and curved lines which form the letters, instead of allowing it to produce forms totally at variance to those which are desired.

The correction can be made with greater thoroughness, and the child's work kept for further reference and comparison. Paper has also the advantage of being cleaner in use than slates; a sponge should always be used with the latter.

10. Copy-books.—Two kinds of books are in common use—

(1) **With Headlines.**—These have the advantage of placing a perfect copy before each child; but they should never be used unless accompanied by black-board teaching and black-board correction.

The danger of headline copy-books is that children, after writing the first line, will not look at the copy; hence, in choosing a book, be careful to let your choice fall on one in which the copy is repeated at least once on the page, so that it may be distinctly seen without raising the head. If this is not done the child will be certain to copy its own writing instead of the model presented.

To obviate the danger pointed out, loose slips to move up and down have been tried, but it is found they are inconvenient in practice.

If copy-book writing is to be accompanied by black-board teaching it is essential that all children should write *the same copy* at the same time. To allow of this, books have been published in which the headlines are cut away from the page, so that any copy desired may be used. The same result can be obtained by omitting intermediate copies which can afterwards be written. If the pages are numbered it facilitates reference.

(2) **Without Headlines.**—Where the teacher is himself a good writer this system has many advantages. If the discipline is good, and the attention can be commanded, the children

see the copy produced, and note the mode of production; difficulties can be graded, and the same copy be repeated as often as is found necessary; all children are always engaged on the same copy, hence there can be effective class teaching; and, finally, the teacher's own writing is a great stimulus to children to endeavour to equal it. With a weak teacher the result is disastrous. There is also the danger that the same style may not be preserved throughout the school.

11. Holding the Pen.—A general uniformity in this respect should be aimed at. The hand should be supported by the fore-arm, the wrist being raised from the desk by the hand resting on the tip of the little finger. The pen should slope in the direction of the inner fore-arm, and be so held that both parts of the nib lie evenly on the paper. The third finger should be bent back, the fore-finger placed on the top of the pen, the second finger touch the side, and the thumb be placed on the opposite side.

The pen should be held lightly, and sufficiently far from the point to secure freedom of motion. The fingers should be slightly arched, but not cramped. The correct way to hold the pen should be taught by means of a drill.

12. Proper Posture.—The child should sit erect with the head slightly bent, the body parallel with the desk, and the feet firmly planted on the floor or foot-rest. The left arm should be placed on the desk near to the side in order to steady the body, and the left hand should hold the paper firmly. The book should be parallel with the edge of the desk. The children must not be allowed to bend the head down to the paper.

13. Size of Writing.—A large size shows better the defects of formation, but little fingers cannot move the pen over a wide range without moving the hand bodily. It is well therefore to start little ones with the small letters without loops, made between lines three-eighths of an inch apart. When these are mastered the size may be reduced somewhat, so as to allow the looped letters to be introduced.

When children are allowed to write small hand at too early a stage the character of the writing rapidly deteriorates. Small round hand is the least size which should be allowed till Standard IV. is reached. The change to small hand must be very gradual, so as to be hardly perceptible: the *same* copy should be written in the two sizes. Guide-lines should not be omitted

too soon; the same copy first written in guide-lines, and then immediately followed by *free* writing, is a good mode of transfer.

14. Hints for Conducting the Writing Lesson:

(1) **Have everything in readiness.**—The black-board should be ready in a good position for the class to see, and be properly ruled.

The copy-books should be placed ready at the end of each desk, or group of desks, and should be distributed to numbers, thus—

“*One.*” Books passed till the right child is reached; then placed unopened in front of the child.

“*Two.*” The left hand is placed on the book ready to open it.

“*Three.*” The proper copy is found, and the hands are then placed behind.

When books are collected, all those belonging to one row should be tied together in a bundle, and the number of the row placed on the top book. This saves much time in giving out.

The pens should be similarly distributed; and before being collected they should be carefully wiped on a sponge or rag.

(2) **Write the copy in sight of the class.**—Whether headline books are used or not, the copy should always be written on the black-board whilst the children watch the teacher. Close attention is absolutely essential to success; therefore call attention to the chief points of difficulty as the copy proceeds. Remember your children are critical; therefore practice the copy well beforehand that your writing may indeed be a model copy.

Complete the copy at once, so that the children may see the whole of what is to be written. As you proceed keep up a running commentary on points you wish the children to observe.

If the copy consists of a sentence, see your children thoroughly understand its meaning; many a useful lesson may be implanted through the written copy.

Next take the special points of difficulty which the copy presents, and show on lines drawn below what constitutes the difficulty and how it is to be overcome. If there are several words in the copy, deal with one at a time.

(3) **See that the correct position for writing is assumed and the pen correctly held.**—This is a matter which is most

expeditiously done to some form of drill which the teacher can easily devise.

(4) **Let the children reproduce the copy.**—Never allow the *whole* copy, unless a very short word, to be reproduced at one time. To secure faithful imitation the attention must be occupied by a few points only; hence the copy should be reproduced a little at a time.

(5) **Correct thoroughly.**—In this lies the secret of success. The teacher should pass behind the children, carefully scanning the work, but never interrupting a child whilst in the act of writing. Errors should be marked with a black lead, *neatly* and *carefully*. The chief errors should be shown to the whole class from the black-board. Faults should be exaggerated, so that the special point to which the teacher wishes to call attention may be recognized.

In the case of specially backward children the teacher may advantageously make the correct form in black lead on the child's book, to be afterwards traced over by the child.

Never allow more than one line to be written without correction by the teacher. When "Head-line" copy-books are used, a "Trial-paper" for the preliminary practice of special difficulties is most valuable.

See that each copy is *dated* when it is finished. Encourage effort by assigning a *numerical* or other mark, *e.g.* F., F.G., G., to each copy.

If you wish your children to be neat and careful in their work, take care you do not set them a bad example in your mode of marking. Many a book is disfigured by a young teacher's careless scrawl in marking. Think what a disappointment and discouragement this must be to a careful, painstaking child!

The teacher should enter into his note-book for future use every point which is found to present special difficulty to the class. Such a collection becomes in time very valuable.

15. From Copy-writing to Transcription.—An intermediate exercise should bridge the difficulty of passing from one to the other. This is supplied when the teacher first **prints** a sentence to be copied on the black-board, and then beneath it writes the same sentence in *script* characters. The children thus see the kind of exercise expected of them in transcription, and by copying the teacher's script whilst the printed words are in full view, they pass easily to transcription.

16. A Transcription Lesson.—Too often this lesson is regarded by the young teacher as a time of ease, and the children are left to pursue their writing without any black-board teaching or correcting.

Unless a class has become proficient in the exercise, each child should have its book open before it to see what has to be written, but should copy the word from the teacher's script on the black-board. The teacher, after making the children observe the printed word, writes the word on the black-board, calling attention to the many pitfalls which the word presents. The children copy this, and it is at once corrected by the teacher.

Each word is treated in the same way until the whole sentence is completed.

When the sentence is finished, all slates should be cleaned, the black-board turned, and the children at once set to write the same passage *from the book*.

When all have finished, the black-board is again placed before the children, and they are bidden to compare their writing with the teacher's model on the black-board, and correct any mistakes discovered.

The teacher meanwhile is walking round the class carefully noting the characteristic errors; these are shown and corrected on the black-board. After this, slates are again cleaned and the copy written a second time, and once more compared with the teacher's work, and mistakes corrected.

As children show proficiency, their efforts should be rewarded by allowing them to work independently, an honour which little ones highly prize.

SUMMARY.

1. A good model, strict attention to instruction, a quick eye, a flexible hand, and perseverance will produce a good writer.
2. Legibility, grace, and freedom characterize good writing.
3. A roughness and want of uniformity in the thickness of the stroke, a want of parallelism, lack of proportion between the height and width of the letters, curves badly formed, and letters not properly spaced and combined, are the chief defects observed in writing.
4. There are three systems of teaching—the Synthetic, the Analytic, and the Combined Method. Vere Foster's style is an example of the latter.
5. Letters should be taught in groups according to the mode of formation.
6. Two kinds of Copy-books are in use—(1) With Headlines, (2) Without Headlines. Each kind has its advantages and disadvantages.
7. A proper posture and correct method of holding the pen must be insisted on.

8. The size of the writing should be at first large, and then gradually reduced.
9. The copy should be written in sight of the class.
10. Thorough correction is essential to success.
11. There should be a bridge between Copy-writing and Transcription.
12. A Transcription lesson needs to be carefully and systematically conducted.

GOVERNMENT QUESTIONS.

1. Classify the capital letters according to the similarity of their forms, and the order in which you would teach them. Give specimens of any six capital letters, carefully written, so as to illustrate their proportions and the rules for their formation.
2. State how errors in writing may be best corrected so as to benefit the whole class.
3. Which do you prefer in teaching writing—engraved copies, or copies set by the teacher on a blackboard? Give reasons for your preference.
4. In what respects is slate-writing a preparation for writing with pen and ink? What wrong habits is it apt to lead to, and what precautions are necessary in consequence?
5. What are the causes of scratchy, badly-formed, too small and illegible writing, and how would you deal with them?
6. Classify the small letters of the English*alphabet according to the difficulty of writing them, and the order in which they should be taught. Describe, also, the best way you know of *ruling* slates and copy-books for the younger children.
7. What common mistakes are made by beginners in forming the small letters o, t, b, r?
8. What elements are common to the written letters p, q, h, g, d, y? In what order and in what combinations would you teach these elements to infants?
9. Give examples of four of the more difficult joinings which occur in combining letters, and explain how you would, in your writing-lessons, teach the children to master those combinations.
10. What use do you think it right to make of "tracing" in teaching writing? Write in large hand the five capital letters B, K, Q, M, W, and point out the common faults made by learners in forming them.
11. Describe some common defects in writing, and the means you would adopt for amending them.
12. Write one line as a specimen of the handwriting which you would endeavour to teach the first class in your school to reproduce in their copy-books. What are the chief faults to be avoided in respect of the slant or slope of the down-strokes?
13. In writing in copy-books there is a great tendency to repeat the same mistake down a whole page. What is the best method of correcting this?
14. What is the use of "tracing" in the earlier copy-book exercises, and what are the objections, if any, to the practice?
15. What are the advantages of teaching large hand before small or running hand, and how far is it desirable to continue large hand practice in the upper classes? Give a model copy in each hand.

CHAPTER X.—WORD-BUILDING AND SPELLING.

1. Its Importance.—In the past undue importance has been attached to Spelling as a subject of elementary school instruction, and the condition imposed, viz. the preparation of all the passages in three reading-books with almost perfect accuracy, has intensified the evil, and led to mechanical, uninteresting, and unscientific modes of instruction.

Happily this is now a thing of the past; wiser counsel has prevailed, and "The use of the reading-book for spelling lessons should be discouraged" (*Circular* 332). The freedom now given will allow better methods to be employed, and superior results will be produced with a fraction of the former labour.

The subject must, however, still receive close attention; for inability to spell correctly is looked on as the sign of a neglected education, and more or less of a disgrace. To the boy or girl starting in commercial life, correct spelling is a necessity.

2. Its Difficulties.—The difficulties of spelling spring from the same root as the difficulties of reading; these have already been pointed out (p. 80, 4). But in spelling these difficulties are intensified; for no matter how irregular the word may be, each letter and the order in which it occurs in the word have to be remembered; whereas in reading the general appearance which the word, as a whole, presents to the eye is sufficient to recall the sound attached to it.

3. The Proper Time to Master the Subject.—Teachers know that spelling is an act of the memory; the eye must observe the form of the word, and the memory must retain this form for future use. A child with a quick eye for form and a retentive memory will spell well.

Since the memory is most retentive in early youth, it follows that this is the best period of life in which to master the difficulties of spelling. Where skilful methods are employed, all the words used in ordinary conversation should be mastered by a child before reaching the age of eleven years. When young, a child is not so alive to the anomalies which words present; hence much of the difficulty which an adult experiences in learning to spell is not perceived by the child.

4. Chief Aids.—The chief aids to correct spelling are—

(1) **Reading.**—By constantly meeting the word in the act of reading, its form is impressed on the mind through the eye; hence good reading and good spelling are usually closely associated.

Spelling has been allowed by many to usurp the time of the reading lesson; this is quite unnecessary. All that is required is that the eye should dwell for a few seconds on any new word likely to cause difficulty, so that its form may be impressed. The teacher should mark such words, and at the end of the lesson they should be rapidly transferred to the black-board and **pronounced** in syllables.

Encourage children to read at home; for the practice will assist both reading and spelling.

(2) **Clear and Distinct Articulation.**—The experienced teacher has reason to know the many errors which faulty articulation occasions. All “mumbling” of words and slurring of letters and syllables are fatal to good spelling. Teach the **powers** of the letters thoroughly in the infant school, then with clear and distinct articulation and training of the ear to appreciate sound, the battle is more than half won.

“Word-building will be taught more readily in the higher classes of schools if the scholars in the infant classes are taught to give the *sound-values of the letters*, and to recognize such distinctions as those between the long and short sounds of the vowels, or the hard and soft sounds of the letter ‘c’, and have also been trained to articulate distinctly each letter in such combinations as ‘spr’” (“Instructions to H.M.I.”).

(3) **Word-building.**—The great thing is for the child to get a firm grasp of the root-word and to master the common inflections, noting the changes which these produce in the root itself. The alteration in the meaning of the word brought about by the inflection should be carefully studied.

When these things have been grasped, present the child with a list of words which undergo the same inflection, and let him apply his knowledge to the formation of other words from each of these roots. As the child proceeds, the principles of word formation are deepened, and he becomes conscious of a mastery acquired over words and their meanings, a sure stepping-stone to success in spelling.

Enable the child to see that there is to a great extent law and order in English spelling; hence in his earliest efforts

present him only with regular forms; keep to one type of formation till it is thoroughly fixed in the mind before presenting another.

Do not be satisfied with teaching *words* as such. A child cannot be said to have mastered a word until he is able to use it in a sentence; then it becomes a part of his vocabulary. It is by thus combining word-building with transcription that spelling is best taught.

(4) **Word-grouping.**—This aid is much overlooked. A very large proportion of the so-called anomalous words can be effectively taught by means of word-grouping.

By some, word-building is derided as a means of teaching spelling; they say the English language is full of anomalous words each of which must be taught as a separate formation, and they instance such a sentence as this—"The girl will *return* to her work and *earn* a shilling". Here we have five different ways of representing the same vowel sound; there is evidently no law and regularity here. The teacher who attempts to *teach spelling* by presenting children with sentences such as this, is doing the children a grievous harm. All words having a similar vowel sound *spelled in the same way* should be presented to the children *in one group*. When this group has been conquered, another group in which the *same vowel sound* occurs, but *represented by different letters*, should be taught. Thus, before such a sentence as the above is given to the child, it should have mastered groups of words such as the following, each group illustrating the *same* mode of representing the vowel sound:—(a) *irl*, *girl*, *whirl*, *twirl*; (b) *irt*, *dirt*, *shirt*, *flirt*, *skirt*, *squirt*; (c) *irth*, *birth*, *mirth*; (d) *irst*, *first*, *thirst*; (e) *stir*, *firm*, *third*, *birch*, *chirp*. These words would be transcribed and then introduced into sentences; by the time these exercises were finished this mode of representing the sound of "e" in "her" would be well implanted.

When *each* mode of representing the same vowel sound has been similarly grasped, then and not till then, is the time to introduce into the same sentence words in which the same sound is represented by different combinations of letters; for the words used are already familiar to the child, and therefore no difficulty is presented.

This form of word-building from a *common ending*, properly called *word-grouping*, is capable of almost endless development so as to include nearly all the anomalous words.

Word-grouping to show contrast is also an effective aid, *e.g.* "through" and "though", "from" and "form".

(5) **Transcription.**—This exercise should accompany each of the preceding aids. The act of forming the letters and words compels the eye to note each letter carefully, as well as the order in which the letters succeed each other. It is the most effective means of learning the very irregular words. Such words should always be learnt as parts of a sentence, so that their function as well as their spelling may be seen; but few of them should be used at one time; and the same word should be repeated again and again in different sentences, until its form is impressed on the memory.

"Correct spelling is, of course, an essential part of elementary instruction, and often demands considerable labour from the teachers. But this labour might be greatly abridged by the adoption of more skilful methods than are commonly in use. The practice of oral spelling is not only wearisome and uninteresting to children, but it often wholly fails to effect its intended purpose. No child ever learns to spell well merely by reciting aloud the names of the letters which compose a word. It is by judicious exercises in word-building, and in grouping together on the black-board words of similar structure, and above all by more frequent exercises in writing and transcription from books and composition, that the difficulties of our anomalous spelling can be most effectively overcome in early childhood." ("Instructions to H.M.I.")

5. General Principles to be Observed.—In teaching spelling the young teacher should carefully observe the following principles:—

(1) *The eye is the chief agent*; the ear is but a subordinate one.

"It is to the eye rather than to the verbal memory that all spelling lessons should be addressed, and it is by written, not oral, tests that the results of such lessons should be measured" ("Instructions to H.M.I.").

(2) *Law and order must be first taught.*—Just as in reading, irregularities must at first be excluded, so in spelling, the child must be able confidently to apply the knowledge gained by the study of a certain number of words to the spelling of new words presented.

The few irregular words necessary in the early stages for sentence writing should be distinctly stated to be irregular,

and they should be learnt solely by transcription, through sentences into which they are introduced.

"Anomalies occurring in words of common use, such, for instance, as are to be found in the various sounds of the final 'ough', should be postponed to the Third and Fourth Standards, but their frequent occurrence in ordinary conversation would render it unwise, notwithstanding their difficulty, to postpone such words to a still later standard" ("Instructions to H.M.I.").

(3) *Incorrect forms should never be seen.*—That which we do not wish to remember often clings most tenaciously. Hence, to say the least, it is inadvisable—

- (a) To give dictation without previous preparation of the passage by the children, since any word incorrectly written is thereby more firmly impressed on the memory.
- (b) To allow children to see the errors of others.
- (c) To write the incorrect forms of words on the black-board with the view of correcting them afterwards.
- (d) To allow careless correction of errors.

(4) *Repeated transcription is the best means of impressing the correct form.*—Hence all errors should be corrected in writing a sufficient number of times to obliterate the incorrect form and to impress the true form upon the memory.

(5) *The sentence is more interesting than the word.*—"Some of the best teachers of word-building advocate strongly the use of the written sentence rather than of a single word for exhibiting spelling; sentences can be presented through transcription or drawn from the scholars, or elliptical sentences can be given on the black-board by the teacher, containing all the parts of the sentences except the single word to be supplied by the scholars who have already learned the rule to be followed."

"When words are sounded alike but differently spelled, the best way of dealing with them is to require the scholars to put them into short sentences of their own in writing; and by this means to make the spelling exercise helpful as elementary training in composition." ("Instructions to H.M.I.")

(6) *A well graded course of instruction, according to the ability of the children, is essential to success.*—If a child be allowed to work with children in advance of his present attainments, such a course is fatal to success; for he is repeatedly making errors in simple words not taught to this class, and thus doing himself

positive injury. Freedom of classification is most essential in this subject, for in no other, perhaps, is there such a wide divergence in the ability of children.

6. Spelling in the Infant School.—No formal exercises in spelling should be begun until the child is able to read with ease the words to be spelled. Nothing is gained by premature spelling; for, whilst reading, the child is unconsciously learning to spell.

When lessons in spelling are given, only words of regular formation, familiar to the eye, and the meaning of which is known, should be demanded.

"The word-building lessons in infant schools may be usefully restricted to the simple phonic teaching of the more common of the different sounds represented by the letters of the alphabet. It should be possible in infant schools to teach simple combinations which might include, for example, all the simpler closed syllables" (*Circular* 375).

If all Infant Readers were drawn up on true word-building principles, the words of the reading-book, properly classified, would present the most suitable course of lessons, since the children are already familiar with them and with their meaning. But, unfortunately, many very irregular words are found in these books; therefore to demand the spelling of such words because they are contained in the reader (and this is sometimes done) is opposed to true progress.

If the child can spell accurately and without hesitation words containing the short vowel and one terminal consonant, together with one or more initial consonants, and also words with the long vowel sound formed from these by the addition of *e*, and can write from dictation sentences composed of such words, he has a foundation upon which the work of the senior school can be easily built.

Spelling must be taught by means of the **powers** of the letters; the child must recognize a given sound, and know the letter which is used to represent that sound. Transcription is the exercise whereby the spelling of words must be *fixed*. The word-building box and the transcription exercise must go hand in hand.

The word-building lesson should be a *conversational* one, so that interest may be aroused and attention secured.

When words have been built and sounded they should be formed into sentences, such sentences should be printed on

the black-board and transcribed by the children. The elder children should then be able to write one or more of these sentences slowly dictated word by word.

7. Junior Stage.—The scheme of spelling here adopted should be a continuation of the Infant School Course.

"Any scheme of word-building proposed by the teacher should be so framed as to exclude from the lowest four standards all words not in common use.

Any proposed scheme should consist of two divisions—

- (1) Certain classes of words of fairly regular spelling.
- (2) A certain number of words of anomalous spelling.

As the memory is largely assisted by associations of place and by comparison of forms, it might be well to select in the lower standards associated words in common use, as 'chair' and 'table', and to place side by side for purposes of comparison such words as 'fair' and 'fare'." ("Instructions to H.M.I.").

The work of this section should comprise—

- (1) Word-building and word-grouping.
- (2) Transcription based on the word-building.
- (3) Dictation of some of the transcription exercises.
- (4) A few of the commonest words sounded alike but spelled differently. Children should be required to write sentences into which such words are introduced, *e.g.* "blew" and "blue", "there" and "their".
- (5) The commonest of the anomalous monosyllables, *e.g.* "one", "who", "were", "they", &c.

The word-building exercises of these little ones should be limited to monosyllabic words containing the short vowels, and to similar words containing the long vowel sounds. All the more common irregular ways of representing the simple vowel sounds should be mastered in this division, *e.g.* *bear*, *fair*, *there*, *their*.

From these words others should be formed by means of the commonest affixes, *e.g.* "ed", "en", "ing", "er", "y", and the children should be expected to master the spelling rules involved in making such changes, *e.g.* (1) dropping "e" before "ing", (2) doubling the final consonant when preceded by one short vowel.

Teachers will find that a course such as this is amply sufficient for real educational work, and that it forms a secure basis for future effort.

8. Intermediate Stage.—The same *classes* of exercises will be continued throughout this stage. The children should be able to build from roots by means of all the ordinary terminations, such as “sion”, “tion”, “ance”, “ancy”, “ence”, “ency”, &c., and to spell all words used in their ordinary conversation.

They should have a good grasp of the changes which the root-words undergo, *e.g.* compel, compulsion, compulsory; navigate, navigat(e)ion, naviga(te)ble.

All the common words sounded alike but spelled differently, *e.g.* “affect” and “effect”, “dependant” and “dependent”, should be well understood and intelligently used in sentences of the child’s own construction.

Spelling rules should be well known and intelligently applied.

9. Senior Stage.—The *principles* of spelling have been already mastered. The work now to be done is to become thoroughly familiar with the words met with in the course of reading; this implies a greatly extended range of spelling.

Attention should be given to the meaning of prefixes and affixes, and the changes these undergo in combination with different consonants, *e.g.* connect, compel, collect.

Business terms, words relating to trades and manufactures, parliamentary, military, and naval terms, and all words which children are likely to frequently hear used or to meet with in the newspaper, should be carefully studied.

Not only must the spelling of such words be known, but the meaning must also be grasped by the children, so that they may use them intelligently.

10. Essentials of a Word-building Lesson.—The following features should characterize any good word-building lesson:—

(1) Sufficient words introduced into one or more sentences written on the black-board, to illustrate the principle to be taught.

(2) Additional examples supplied by the children.

(3) The words collected and examined, and the principle or rule stated.

(4) Sentences formed, illustrating the use of the words taught.

(5) These sentences transcribed.

(6) Some of these sentences written from dictation.

II. Outline of a Word-building Lesson (Junior Stage).

Object.—To teach that “y” at the end of a word has the sound of “ē”, and to show how such words should be written.

(N.B. *The doubling of the final consonant has already been taught.*)

Step I. Illustrative Sentences on the Black-board—

- (a) The soil is sand^y, not chalk^y.
- (b) This gloom^y room makes me sleep^y.
- (c) Her hair was wav^y and her face ros^y.
- (d) A sun^y day was followed by a star^y night.

Step II. Collection of the Examples—

- | | | | |
|--------------------|--------------------|------------------|------------------|
| (a) | (b) | (c) | (d) |
| sand ^y | gloom ^y | wav ^y | sun ^y |
| chalk ^y | sleep ^y | ros ^y | fog ^y |

Step III. Other Examples supplied by Children—

- | | | | |
|--------------------|--------------------|-------------------|-------------------|
| (a) | (b) | (c) | (d) |
| grass ^y | wood ^y | ic ^y | mud ^y |
| dirt ^y | cheer ^y | brin ^y | skin ^y |
| crust ^y | soot ^y | juic ^y | fun ^y |

Step IV. The Examples examined, to show—

- (1) The sound of “e” at the end of a word is represented by “y”.
- (2) The “e” of the root is dropped before “y”.
- (3) The final consonant is doubled before “y” when it is preceded by one short vowel.

Step V. Transcription of—

- (a) The words.
- (b) The model sentences.

Step VI. Dictation of—

- (1) Model sentences.
- (2) Sentences introducing words used.

Notes of Method.

I. Have these sentences read, exaggerating the sound of the “y”. Mark off the letter representing this sound, as shown.

II. Children name the words in each sentence having the “y” sound, and the teacher arranges them as shown.

III. Children supply similar words, and say whether they are to be placed in column (a), (b), (c), or (d). All words are to be given in sentences.

IV. (1) This is at once recognized and stated.

(2) From column (c) the children see the meaning of the dot (·) used by the teacher, and state the rule.

(3) This is already known, and is restated.

Write (1), (2), and (3) on B.B., and let children repeat till known.

V. Children to copy the words and sentences.

VI. Teacher will carefully construct and dictate sentences containing no *new* difficulty.

12. Anomalous Words.—As we have already said, these should be learnt one at a time by introducing them into sentences, which are then transcribed. But when there are several words presenting the same irregularity, these should be taught

in a group, and attention called to the characteristic feature of the group, *e.g.*—

- (1) In each of the following words "o" has the sound of short "u"—won, wonder, month, money, honey, monkey, Monday, front, other, another, mother, &c.
- (2) In the following words "ou" has the sound of short "u"—touch, young, double, trouble, couple, country, &c.

All such words should be transcribed, and then formed into sentences, and the whole sentence transcribed, *e.g.* "I wonder if another month's money will come on Monday".

When irregularities are thus treated in groups, children recognize a certain amount of regularity in the words; this is a great help in acquiring and retaining their spelling.

13. Words Pronounced alike but Spelled differently.—These can be taught only by using them in sentences. The same sentence should, if possible, contain both words.

The children should be called upon to ascertain the meanings of the words to be taught, by examining a number of sentences written on the black-board by the teacher.

When this is done, one typical sentence containing both words should be committed to memory, *e.g.* "We **tracked** (traced) them over a wide **tract** (wide space) of country".

A few sentences proposed by the children should then be examined, and the correct spelling of the words determined.

When this is done, elliptical sentences should be presented, and the child required to fill up the ellipsis with the correct word.

As a final exercise, the child should form and write sentences containing the given words correctly used.

14. Transcription.—Although this is a very useful exercise for teaching the common irregular words and the use of capitals and punctuation marks, as well as an aid to composition, it has its dangers, against which young teachers should be on their guard. The efficiency of the exercise as an aid to spelling depends entirely on the *thoroughness* with which the exercise is conducted. If any inaccurate work is allowed the exercise becomes a positive evil; for the incorrect form is thereby impressed. The supervision and correction must, therefore, be most strict during the lesson.

In the hands of a lax teacher, too, much transcription causes the quality of the handwriting to deteriorate.

15. **Dictation.**—This exercise is a *test* of spelling rather than a means of teaching spelling; but writing from memory words previously learnt helps to fix their spelling.

Dictation is a means of *teaching* spelling, if preparation of the passage precede the dictation of it; and this again be succeeded by thorough correction and learning of the errors.

(a) *Preparation of the passage.*—Too often, in the case of inexperienced teachers, the dictation lesson consists in choosing the hardest passage which can be found, making the children write it from dictation without previous preparation, and then allowing little or no time for the correction of errors. The harm done by such an exercise need not be pointed out to the reader of the previous pages.

The success of the exercise depends upon the *thoroughness* with which the passage is prepared. Each child should have a book, and should read the passage slowly, phrase by phrase, with the teacher. Clearness of articulation, especially in regard to the terminations, must be insisted on. All difficulties, whether of word or phrase, will be carefully explained by the teacher. Words and phrases of special difficulty will be written on the black-board by the teacher, and the words will be divided into syllables. After *pronouncing* these carefully in syllables, they will be transcribed three times each by the child. When this is done, *the whole passage* will be carefully transcribed.

If time allow, the passage, or some part of it, will be dictated; if there is no time, the dictation will be deferred to the next day.

In the upper classes only special difficulties need be alluded to. In these classes children may be set to prepare a page in silence, and from this the teacher will select a passage.

(b) *Dictating the passage.*—Before the writing from dictation is begun, the teacher should attend to pen drill and to the correct position for writing; these should be maintained throughout the lesson.

The teacher should take up a position where he can be seen by the whole class, and where also he himself can have every pupil in view.

When all eyes are fixed on the teacher's face, he should begin to dictate in short phrases, clearly, distinctly, and in a natural speaking tone. Be sure to speak in such a tone that every scholar in the class may, if he choose, hear you distinctly, and then never repeat a phrase once dictated; frequent repetition only tends to make children inattentive.

When the phrase is finished, the children should again look at the teacher's face, so that he may know when all are ready for the next phrase. If the teacher anticipate any difficulty, it is better to give slight help than to run the risk of having the word incorrectly spelled by the majority of the class.

(c) *Correcting the exercise.*—Undoubtedly individual correction by the teacher is best; but with a large class this is impossible. Correction by the teacher whilst dictating the passage is not to be commended. Two methods remain—

(1) When the passage is finished, reading-books are opened, and each child corrects his own exercise from the book. Where children have been trained to truthfulness in word and act, and where the discipline is of the right kind, there is little danger of incorrect marking. Whilst the children are engaged in this exercise, the teacher can walk round the class behind each row, and note that the marking is accurately done, as well as the type of errors made.

When all have finished, and the number of mistakes have been placed in a neat figure at the foot of the exercise, the teacher should call on five or six children to bring their exercises to be thoroughly examined by him. This will check any tendency to dishonesty, should it exist.

(2) Let a boy collect two books from the left end of each desk; these are brought and placed at the right end. All books are then passed *two places to the left*. No child now has its own book.

The corrections may be made either, as before, from the open reading-books, or by the teacher spelling aloud all difficult words or phrases.

The danger of this second plan is that children will see the errors of others, and thus their own spelling will be unsettled.

A definite plan of marking errors should be insisted on, *e.g.*—

1. A circle placed round all alterations or insertions, *e.g.*

①
attend.

2. A line drawn *under* every error, *e.g.* [^]center.

3. A stroke drawn *through* a wrong letter, *e.g.* coming.

4. A caret (^) put to show the omission of a letter or a word, *e.g.* prom t; "They light".

Let the date at which each exercise was worked be placed at the foot.

(d) *Eradicating errors*.—The last step is a very important one, viz. impressing the correct form of errors discovered. Ample time should be allowed for this. Each word should be found out in the book, and written at least *three times* at the foot of the page. Each error should then be written *once* at the end of the book. As time advances each child has collected a permanent record of its own individual difficulties. Opportunity should be found for frequently transcribing these words, to impress the correct form.

16. Silent Dictation.—An occasional useful exercise is furnished by the following plan.

Everything is prepared as for a dictation exercise, but the black-board is placed in writing position in front of the class. All eyes are directed to the board, whilst the teacher writes on it a word, phrase, or sentence. The children are allowed to look steadily at these words for a few moments, and then they are covered by the T-square.

At the word "Ready" the writing position is assumed, and the children commence to write the passage just written by the teacher. When all have finished, another word or phrase is similarly treated.

This exercise cultivates close attention on the part of the children, aids the spelling, and saves the teacher's voice.

• SUMMARY.

1. Early youth is the best time to conquer the difficulties of spelling.
2. Reading, clear and distinct articulation, word-building, word-grouping, and transcription are the chief spelling aids.
3. Word-building shows the growth of words; word-grouping lessens the difficulty of spelling by teaching at one time all words presenting points of similarity or contrast.
4. Transcription impresses the form of words through the eye.
5. The eye is the most important agent in learning to spell.
6. Irregularities in spelling must be excluded from the early lessons.
7. Incorrect forms of words should never be seen.
8. Words should be learnt in connection with a sentence.
9. The spelling of familiar words of regular notation alone should be required of infants. These should be taught by conversational word-building lessons followed by transcription.
10. Word-building, word-grouping, transcription, and dictation should find a place in the spelling scheme of any class.
11. A word-building lesson should consist of the examination of illustrative sentences, the collection and arrangement of the typical words, the stating of the principle or rule they illustrate, together with transcription and dictation exercises.

12. Anomalous words must be learnt by transcription and word-grouping.
13. Words pronounced alike but spelled differently must be taught through sentences.
14. Dictation is a test exercise, but properly conducted it is also a method of teaching spelling.
15. The passage for dictation must be well prepared, clearly dictated, and thoroughly corrected.
16. Silent dictation is a useful exercise.

GOVERNMENT QUESTIONS.

1. "Dictation is only an indirect means of teaching spelling, and is mainly a *testing* exercise": Why is this so? Describe how you would carry out a dictation lesson so as to make it helpful towards the securing of correct spelling.
2. "Word-building" is a common exercise in the upper classes of a school. Give examples of this exercise, and say what is the use of it.
3. What are the uses of dictation exercises? Describe fully how such an exercise should be prepared for and performed, so as to secure these ends, in the case of a large class.
4. Take the following words, and give a list of others which might be grouped with them for a spelling lesson:—*rough, should, which, many, taught*.
5. Name eight words in the spelling of which young children often make mistakes, and explain by what sort of exercises such mistakes may be corrected or avoided.
6. How can spelling be best learned, orally, by writing, or by any other plan? Say how you can secure the right spelling of the difficult words in a reading lesson.
7. Mention half a dozen examples of the way in which careless or indistinct articulation leads to bad spelling. What help would you give to prevent mistakes in words containing the sound variously written *ie, ei, ee, e*?
8. What rules have you learnt to observe in giving out and correcting dictation?
9. It is sometimes complained that children do not read well, because their reading lessons are constantly interrupted by the oral spelling of the more difficult words. Do you consider such interruption necessary, and, if not, how may good spelling be attained without it?
10. Name some of the most common faults of young assistants in teaching spelling. How much of a spelling exercise should be oral, and how much should be written?
11. What is the educational value of dictation? Is it a means of teaching spelling? If so, how should it be used as such?
12. Which of the following words present spelling difficulties:—*suit, their, full, bear, tear*? Explain why.
13. What bad habits are produced by careless correction of exercises?

CHAPTER XI.—COMPOSITION.

1. **What it is.**—Composition is the art of expressing one's thoughts in words; it is evident, therefore, that there are two forms of this exercise—*oral* composition, and *written* composition.

The subject is by no means an easy one to children; for it requires that children shall have a fairly good vocabulary, and a thorough grasp of the meaning of the words they use, as well as ability to arrange these words in such a way that they express thought clearly, tersely, and without violation of the laws of language.

For essay writing the children require in addition a good general knowledge of facts connected with the world of nature and art, and ability to arrange these facts in logical sequence.

2. **Its Difficulty.**—The very limited extent of the average child's vocabulary is one of the greatest difficulties. Frequently home influences militate against grammatical accuracy; and the provincialisms, so deeply inbred, are stumbling-blocks to progress.

Added to the above, we have to recognize the fact that, until quite recently, little or no attempt has been made in the infant school or lower standards to cultivate the art of oral composition; consequently children have had to commence formal written composition exercises without possessing even the ability to form with accuracy a simple oral statement.

The majority of children read little out of school hours; consequently they have few ideas; and the education they have hitherto received has not tended in any great degree to develop the power of observation so that they may acquire knowledge by actual experience.

Without knowledge of facts, and with little command of language, formal composition is a task of supreme difficulty to the child and an anxious one to the teacher.

3. **Aids to Success.**—The practical teacher knows what a marked contrast there is between the composition exercise of a child coming from a refined home, and that of a poor little street Arab. The daily conversation of the home has made this difference. This fact should impress the teacher with the important influence his own language is able to exert over his scholars, and make him careful that his speech should ever present to the children a model of correctness and good taste.

Strive to cultivate in children a taste for reading; for in its

pursuit the mind will be strengthened, the imagination aroused, new ideas acquired, the vocabulary enlarged, and, what is more, correct modes of expression learnt.

Train children from early infant-school days to express clearly and accurately in complete sentences what they see, hear, or think. Progress will be slow, but sure; and the gain to the child, resulting from this preliminary training, will be very great.

See your transcription exercises are so conducted that the attention of the children is directed to the use of words in the sentence and the order in which they are arranged.

The grammar lessons, especially when from the beginning they are based on analysis of sentences, should be fully utilized as training exercises in formal composition.

4. Oral Composition.—Language lessons should form the staple of infant-school training, from the Babies' Class upwards. First the *thing* is presented, then its *name*, lastly a *statement* with respect to it is made; e.g. The teacher holds up a spoon and asks "What is this?" To which the children reply "It is a spoon".—"What have I?" *Answer*: "You have a spoon".—"What can you see?" *Answer*: "I can see a spoon". Here are some of the simplest exercises in language in which even the youngest child may take part.

The "Conversational Lessons" of the infant school are of the greatest value as aids to oral composition. They train the eye to see and store the mind with facts; they give the appropriate name for the new fact taught; and they teach children to use the new word in a sentence, so as to give expression in words to the new idea. The ability to give voluntary expression to a few ideas is of far more educational value than acquiring much information without the power of expression.

Infant-school methods should be continued in a modified form in the senior school. The reading lesson offers a splendid field for training in oral composition. In the book there are certain facts stated in words; but too often some of these words are but empty sounds conveying no ideas to the children. This is at once apparent when the teacher's questions are so framed as to require the use of the word by the children. Power to use or to recognize the use of a word is the true test to intelligent understanding. The reading lesson is a training in accurate expression.

Class subjects, especially Object Lessons, and all oral lessons, offer similar scope for training in elementary composition. Every request made by the child, and every answer given, should be invariably made in a complete sentence. That this may be done, the teacher must exercise care in the framing of his sentences, so that the answers required for the younger children need consist only of two or three words. As the child advances in general attainments, the teacher should vary the scope of the question, so that answers of greater length are rendered necessary. In the highest class the children may be called on to give orally a short description of some scene witnessed or event which has happened.

5. Written Composition.—Under the old system of mechanical spelling a child spent the first four years of its life in the senior school endeavouring to *cram*, with more or less success, the whole of the words it met with in its reading-books. The result was, that at the age of ten or more, it was quite unable to form a simple sentence accurately, either orally or in writing. The superficial nature of the training, even in *spelling*, which this method afforded, was shown by the errors the child made in reproducing in its own words the simple narrative exercises.

For four years the child had been collecting a heterogeneous mass of words, with the use of the majority of which it was unfamiliar. It was then suddenly called upon to make these dry bones live. No wonder it failed in its efforts! Happily wiser counsels have prevailed. The child is now to be taught to recognize that words are living things. By a course of word-building lessons it is to watch their growth; and then, by simple composition exercises, it is to learn their practical value in giving expression to its own thoughts and feeling.

When a word is learnt it is to be at once used; it will thus become a part of the child's vocabulary. Each new word acquired represents a new power of expression, and stimulates the child to increased effort; it has an object in mastering new words. Interest, the great stimulus to success, is aroused; therefore progress is easy and rapid.

"The offered alternative of Composition for Dictation throughout the school will also give relief, inasmuch as the spelling of those words only which form the common vocabulary of children will be required in the four lowest standards. The practice of composing short sentences will also promote

the writing of correct English, and in some measure supersede the teaching of the formal rules of grammar." ("Instructions to H.M.I.").

The training in *oral* composition given in the infant school will be at once utilized and supplemented by written composition exercises. The function of words, phrases, and clauses will be explained in a familiar way without introducing the technicalities of grammar.

A strictly progressive and systematic course of work must be laid down; it may be divided into three stages—Junior, Intermediate, and Senior, the latter representing the work of the highest classes in the school.

6. Junior Stage.—For the youngest children the following are suitable exercises:—

(1) The making of *oral statements*, in complete sentences, with regard to the qualities, uses, &c., of different familiar objects.

(2) The *transcription of sentences* thus formed under the teacher's guidance.

(3) *Supplying the ellipsis* in a sentence, as a training in the exact use of words.

Independent written composition is not to be expected at this stage. The main object is to teach the function of words and their arrangement in sentences through the *imitation* exercise of transcription.

At this stage the use of grammatical terms is unnecessary. Without these the child may be made to grasp the idea of the function of the subject and predicate and their agreement, and the necessity for the object. The use of the adjective and the adverb may also be shown, as well as the way in which these words are formed from other words. The use of the pronoun as a substitute for the noun will be readily taught. The alteration necessary in order to turn a statement into a question should be shown; and the children should recognize that the same word may have different functions when used in other sentences.

7. Intermediate Stage.—To the different kinds of exercises recommended as suitable for the previous stage, we may here add—

(1) *Formation of sentences* with given words.

(2) The *correction of faulty sentences*.

(3) The *substitution of equivalent phrases and clauses* for words and phrases.

(4) *Composing sentences* about different familiar objects.

As the lessons proceed, instruction will be given in the principles of punctuation.

At this stage the idea of the phrase and clause will be developed. Children will be shown the use of conjunctions and relative pronouns in combining simple sentences to form compound and complete sentences; and the use of direct and indirect speech will be taught.

The aim at this stage is to give the children an insight into the structure of the sentence by means of phrases and clauses, so that they may be enabled profitably to undertake the Narrative Essay-writing of the senior stage.

8. Senior Stage.—At this stage the exercises may consist of—

- (1) The reproduction of a story read.
- (2) An essay on a familiar subject.
- (3) A letter, either of a social or business character.

Before children leave the elementary school they should be able to narrate an incident, to write a simple essay, and to compose a letter such as may at any time in their future life be necessary, tersely, logically, grammatically, and with some attempt at style.

9. Narrative Composition.—The child's first attempt at continuous, connected composition should be of a simple character. The narrative of an incident witnessed or a story read is a suitable exercise; for it not only supplies the facts on which to found an essay, but determines the order in which these should be presented.

To write an essay requires facts and ideas in which children are deficient, as well as a logical mind to determine the order in which these facts would be most suitably stated.

The narrative is also a help in teaching composition; for, by listening to the story, the child receives a training in forms of literary expression, and its vocabulary is greatly enlarged. Narrative composition may, therefore, be considered a stepping-stone to essay-writing, in which the child has to depend entirely on its own ability both in regard to the matter and arrangement of the essay.

(a) *Suitable stories.*—The first stories presented for reproduction should be very short; a narrative of five or six lines is ample. The story must be such as will excite the child's in-

terest; and it must be read or narrated a sufficient number of times to fix the facts well in the memory. The "point" of the story should be obvious to the child; and if it is of an amusing character, it is all the more attractive and suitable.

From these early narratives direct quotations should be excluded, unless children have undergone the full systematic training of the early stages. The length and difficulty of the story will increase as confidence is gained.

(b) *Communicating the story.*—At first it is much better to tell the story than to read it; the point we are aiming at, is *original* narrative, not the reproduction of the very words of the story. Some children have such retentive memories that a short story read twice can be reproduced almost word for word. In *telling* the story the teacher takes care, whilst maintaining the order in which the facts are presented, to vary the phraseology; the child is thus thrown on its own resources. The "point" of a story told is always better grasped than a story read.

As the story is told, the teacher makes a brief analysis of it, point by point, on the black-board.

When this is completed the story is again told, so that the children may see how this skeleton is clothed.

(c) *Oral reproduction.*—Too often the child is now set to reproduce the story in writing: this is a mistake; for ability to reproduce the story *orally* must precede any *written attempt*; otherwise time is wasted and little good results.

The teacher should take the first "point" of the skeleton outline and *ask such questions* that the answers will reproduce this part of the story. These answers are then woven by the children into a complete statement in narrative form of this part of the story.

The child's attempt is written by the teacher on the black-board and subjected to the criticism of the other members of the class and finally of the teacher, until all inaccuracies are rectified and a model statement is formed. This statement is now written on a second black-board.

And here let us add a word of caution as to the manner in which the criticisms are made. Children are extremely sensitive; care must be taken, therefore, that the child's feelings are not hurt or his efforts discouraged, by criticism. Give praise to any honest attempt; select what is good in the answer, and help the child to mould it into the correct form.

By writing the statement *without* punctuation marks, show their necessity; and, from previous teaching, draw from the children the appropriate marks to be used.

Each part of the story will be treated in the same way, until the complete model appears on the second black-board. This should then be read collectively by the children.

Turn the black-board, and call on the children individually to take up the story, point by point, from the analysis, so that they again *orally* narrate the whole. As far as possible, avoid set phrases and aim at as great a variety in the mode of expression as the subject allows. When the children can *orally* reproduce the story with ease, the first and most important stage is ended.

(d) *The story written.*—The next step is to set the children to write out the narrative *with the help of the black-board skeleton*. When all have finished, place the model before the children and allow them to correct their exercises from it. They should themselves discover points omitted, the wrong order of events, mis-spellings, and grammatical errors.

The teacher then corrects these final attempts of the children. Characteristic errors are noted, and corrected with the help of the black-board.

After listening to the teacher's black-board criticism, and studying the teacher's corrections made in their own books, the children again write the complete narrative, this time *without the help of the black-board skeleton*.

All this cannot be done in one lesson; it may occupy three or four; but until the children have learnt to reproduce one narrative *well*, it is useless to take up the study of a second. Principles are best learned in a limited area.

(e) *Correcting the story.*—The correction of the stories is an important point; to be effectually done, it must be the work of the *teacher* himself. Monitors may be used to mark mistakes in spelling, grammatical errors, and points omitted, but the teacher's *final* correction is absolutely essential to progress. To leave an error uncorrected is to intensify the evil; and, in addition, the teacher fails to get a grasp of the difficulties which the children experience.

The correction may be made in part whilst the composition is in progress, by the teacher passing behind the children: this facilitates both individual and class correction of mistakes,

but the final correction should be made when the whole is completed.

The teacher will do well to enter in his note-book for future use characteristic mistakes in grammar, provincialisms, &c. These should, at frequent intervals, be dealt with from the black-board.

Some distinguishing sign to indicate the *character* of the mistake, should be adopted; the following marks have been found useful for this purpose:—Gr. = grammatical error; Sp. = error in spelling; Rp. = repetition; Fs. = false sequence; Amb. = ambiguity; Tt. = tautology; Wr. = writing; Pn. = punctuation, &c. These signs should be entered in the margin.

If the teacher attach a *numerical* mark to each of these indicative of the seriousness or otherwise of the error, by totalling the marks attached to the different classes of errors, he has a simple and accurate means of estimating the nature and number of the errors which occur. Thus an exercise to which is attached Gr. 7, Sp. 14, Rp. 2, Fs. 2, &c., shows the writer to be weak in grammar and spelling.

10. Characteristic Errors.—Both in narrative and essay writing certain errors are constantly occurring. Each of these should be made the subject of special class teaching. It is a great mistake to attempt to correct too many errors at one time; the best plan is to select the most important, and to battle with this until it is conquered. Another will then be taken in hand; and so on, step by step, until all have been reviewed and uprooted.

The grammatical errors so well known to experienced teachers are chiefly connected with the following, although there are many others:—

(1) *Agreement of the Subject and Verb.*—Here we get—

- (a) The compound subject with “and” used with a *singular* verb, e.g. “The boy and girl *was* sent home”.
- (b) A *singular* subject enlarged by a phrase ending with a plural noun, used with a *plural* verb, e.g. “The house built on piles *begin* to sink”.
- (c) Two *singular* subjects connected by *or*, *nor*, *either* ...*or*, *neither*...*nor*, used with a *plural* verb, e.g. “Either Dick or Sam *were* there”.

(2) *The Verb*.—The commonest mistakes here are—

- (a) The *participle* used for the *past* tense, e.g. "He *done* it".
- (b) Incorrect sequence of tenses, e.g. "I shall go and *lay* down". Conjunctions join the *same* tenses.
- (c) Sentences beginning with "there", e.g. "There *was* five boys in the field".
- (3) *The Pronoun*.—In this class we find—
 - (a) Changes made in the number or person of the pronoun, e.g. "We saw the lion. I had a shot at *him*, and *it* fell dead".
 - (b) Conjunctions should join the *same* cases, e.g. "All were invited, except you and *I*".
 - (c) The use of the *relative* pronoun, e.g. "*Who* are you talking to?"
 - (d) The pronoun after the verb "to be", e.g. "I am sure it is *her*".

(4) *Clauses*.—Omission of the verb in the principal sentence when a clause intervenes, e.g. "The men *who* stole the goods last week".

II. Essay Writing.—We have already stated wherein this subject is more difficult than narrative writing. The material for the essay is to be supplied by the child; he must exercise a wise discrimination in deciding what to include and what to omit, and the chosen matter must be presented in logical sequence: it is evident, therefore, that further tuition is necessary before the child can successfully cope with this form of exercise.

The transition to essay writing will be made easier by a judicious selection of subjects for the child's first attempts. The subjects chosen should be those with which he is intimately acquainted by personal observation, and in which he feels an interest; thus the domestic animals, sports, &c., are useful and suitable subjects for essays.

We must not give children too much credit for knowledge with respect even to the most familiar things; the practical teacher knows that facts must be taught even about the best known subjects. Object lessons, lessons in experimental science, and descriptive geographical lessons, all afford excellent material for essays. The exercise is also helpful in fixing the matter of such lessons and testing the children's grasp of the subject.

Abstract themes, such as "Good government", "Taxation", &c., should be excluded, until children have attained considerable proficiency; and then they are only adapted to advanced pupils.

Logical arrangement is an important factor in successful essay writing; one of the teacher's first efforts is to impress this important fact upon his pupils, and to enable them to decide on the main divisions into which the subject naturally falls.

This suggests the division of subjects for essays into classes, each of which shall be studied individually, and suitable divisions discovered. A child will thus experience little difficulty in deciding on suitable "headings" for an essay on an animal, a vegetable, a mineral, a natural phenomenon, a biography, a town, a sport, a trade, &c. Practice should be given in the preparation of such "headings".

When this part of the subject has been settled the facts appropriate to each sub-division should be acquired. In the early essays it should be possible to gain this information by an examination of the object itself, or a representation of it. The teacher's questions should guide the children in this work, and the information gained should appear on the black-board in skeleton form.

When the skeleton is completed the method of procedure is exactly the same as in narrative composition. The essay is *orally* composed by the children, point by point, and subjected to the criticism of both pupils and teacher. When each point is accurately stated it is written on the black-board by either teacher or pupil.

The essay is again composed by the children (the model essay being turned), and this is followed by the written effort, first with the aid of the skeleton, and then without it.

The method of correction is the same as in the narrative exercise.

This essay should be followed by another of *the same class*, requiring similar treatment; and a different class of subject should not be selected until the children have a thorough grasp of the method and arrangement of an essay on any subject which falls naturally into this class, and show considerable facility in writing such an essay.

Some teachers announce beforehand the subject chosen for

the text essay, and require the children to collect information with respect to it from books or by observation. This is a good plan, especially if the children are supplied with the "headings" under which the essay is to be treated, so that their reading or observation receives direction.

12. Letter Writing.—This exercise is most useful and instructive, and one, moreover, in which experience shows instruction is needed. No child should leave our elementary schools unable to compose and write creditably a letter on any ordinary social subject, or a business letter, such as an application for a situation, or a letter of regret and apology to an employer for absence from business.

It is not safe to assume that a child knows even how to head a letter correctly, the proper form of commencement under various circumstances, or a suitable mode of termination. The correct form of addressing the envelope must not be overlooked.

If, in points such as these, the child need instruction, much more is this necessary in regard to the style of the body of the letter. Suitable styles for business and social letters should be thoroughly studied and practised.

Encourage children to aim at directness of statement, clearness, and logical arrangement; and impress the importance of neatness, good writing, and careful arrangement.

This exercise should always be done on the ordinary note-paper.

SUMMARY.

1. The limited vocabulary of children, the lack of ideas, and the want of previous training in oral composition, make formal written composition exercises a difficulty.

2. The teacher's own language, reading, transcription, grammar, and oral lessons should all be utilized as aids.

3. The "Conversational Lessons" of the infant school afford valuable training in oral composition. Infant-school methods should be adapted to and continued in the senior school.

4. Composition should be a subject of instruction throughout all classes of the school.

5. A scheme of instruction should be drawn up suitable for junior, intermediate, and senior pupils.

6. Continuous narrative and essay writing should be reserved for the senior stage. The structure of the sentence should engage the attention of the younger children.

7. Narrative is easier than essay writing.

8. Oral composition should always *precede* the written exercise.

9. The correction should be systematic and thorough.
10. The teacher should make a collection of characteristic errors.
11. The treatment of the Essay is similar to the Narrative exercise.
12. Letter writing should be taught.

GOVERNMENT QUESTIONS.

1. Describe the best exercises you know in English composition, and the best way of correcting them.
2. Point out some of the common mistakes in the composition exercises of children as regards the use of relative pronouns, conjunctions, and punctuation.
3. After a class has reproduced in writing a short story which you have previously read to them, what is your method of revising the exercise?
4. Show that grammar and composition may be taught simultaneously from the first.
5. What are the chief points to be attended to in correcting the composition exercise (*e.g.* a letter) of an older class?

CHAPTER XII.—FIRST STEPS IN ARITHMETIC.

1. Importance of Arithmetic.—Probably more time is devoted in our elementary schools to the teaching of this subject than to any other. This is occasioned partly by the inherent difficulty of the subject owing to our cumbrous system of weights and measures, but also because of the benefit derived from the study, affording, as it does, mental training and practical usefulness.

The English have been called “A nation of shopkeepers”; the practical value of a knowledge of arithmetic to the manufacturer, the tradesman, the mechanic, the clerk, the accountant, &c., is therefore at once apparent. To the methodical housewife, as well as to the child in its games, it is alike equally useful.

But to be of value in business, calculations must be made quickly and accurately; this is only attained by much practice.

As a means of mental training, arithmetic is the most important subject of the elementary school curriculum. Nothing need be taken for granted; every truth is capable of demonstration, and each new truth is seen to grow out of what has preceded. Thus the child is trained to investigate, to think in logical sequence, and to advance step by step along a chain

of reasoning, until the desired truth is demonstrated. In this process the child learns the value of methodical arrangement and clearness of statement; he is taught to discern the essential from the non-essential, and to seize on that which is useful for his purpose; he is trained to habits of close attention and fixity of purpose, knowing no rest till the end is attained. Each successful effort tends to make him more and more conscious of his powers, and implants a spirit of self-reliance and perseverance.

Qualities such as these are of the greatest value in all the affairs of life; hence, when this training is given, the large amount of time devoted to arithmetic is fully justified.

2. Arithmetic Taught for its Practical Value.—

When this is the sole motive of the teacher, his one aim is to make children merely good calculators. Notation is taught with little or no explanation of the theory of number; tables are committed to memory as a task without their structure being explained; rules by which certain results may be arrived at are committed to memory by mechanical repetition, and their successful application secured by much practice.

The result of such teaching, under a strict disciplinarian, is to produce accurate work in the lower stages of the subject, and in any class of question which is of a mechanical nature; but where the question is a little involved, and thought is necessary in order to determine the several steps by which the required result may be attained, then there is a complete collapse.

We hope that such meagre teaching is now to be rarely met with in our schools.

3. Arithmetic Taught for Mental Training and for its Practical Value.—

Undoubtedly, securing practical results must claim a large share of the teacher's time and attention, since these are of great importance; but with skilled teaching and by the adoption of good methods, we contend that practical results need not be sacrificed to mental training, but that both may advance together, hand in hand, to their mutual advantage.

If we teach with this object in view, we must be content to advance more slowly in the early stages than is the case when results only are aimed at. We may rest assured, however, that if progress is slow, it is also sure, and that in the end the goal will be reached quite as quickly, and with far greater ease

and pleasure to the children. Moreover, we shall have *trained* our children to *think*, not to act like machines.

The children are *investigators*, the teacher is but a *guide*; he brings certain things before them, shows them what to observe, and helps them to draw the right inference. The child advances step by step, not blindly, but with a full knowledge of the road by which he is travelling, until the end is reached, and the results of his observations are focused under the teacher's guidance into one short rule easily learnt, remembered, and applied, *because it is understood*: even if forgotten, he knows the way, and can again travel along the same road and arrive at the same point.

Herein lies the great difference in the two methods of teaching; the *starting-point* of one is the *goal* of the other. If the arithmetical exercise is to be of any value as a means of mental training, the child must not only know *what to do*, but *why it is done*. He must not adopt a particular rule for solving a problem because it appears to be of a similar character to others solved in the same way; but he must be able to state *why* the rule adopted *must* give the required result. An explanation which is not the result of the child's own observation and experience, but is learnt and repeated parrot-fashion, is of no educational value.

In the earliest stages we must not expect children to be able to state *verbally* the reason for all they do; it is quite sufficient at this stage if the child shows by its answers to the questions we propose that it *understands* the principles involved in the method of solving.

Under this system of teaching *problematic* work is always done with success, because the child has been taught to *reason*. To such children the way in which the sum is *worded* is of little importance; it can recognize a rule under any disguise.

This is the kind of teaching which young teachers should prepare themselves to give; it will add zest to their teaching and secure the interest and attention of the children.

4. Departmental View of the Teaching.—That the Department requires this twofold aspect of arithmetical instruction to characterize the teaching, is shown by the following extracts from the *Instructions to H.M. Inspectors*:—

“It will be right to report that this subject has been *well* taught if 51 per cent at least of the scholars examined work

the problem (*i.e.* not necessarily give a correct solution, but make an intelligent attempt at its solution), and answer correctly three questions out of the four, or give correct answers to three questions, one of which must be the problem”.

“Satisfy yourself that the reasons of arithmetical processes have been properly explained and understood. This is a department of school-work which has been much overlooked. There is in an elementary school course scarcely any more effective discipline in thinking than is to be obtained from an investigation of the principles which underlie the rules of arithmetic. It is therefore desirable that you should very frequently ask the teacher of the class to give a demonstrative lesson on this subject; and he should so work out an example on the black-board as to make the reason for every step of the process intelligible and interesting to the scholars. When children obtain answers to sums and problems by mere mechanical routine, without knowing why they use the rule, or when, on receiving a question or a problem, they ask, ‘What rule is it in?’ they cannot be said to have been well instructed in arithmetic. The Code provides that in the lowest three standards, if the managers so desire, the intelligence of the class may be tested by sums worked with the help of the black-board, instead of by the written exercises, which will only be needed to test the accuracy and neatness of the work.”

The first extract demands accuracy in the working, the second mental training.

5. General Essentials of Success.—The young student who would be a good teacher of arithmetic, should bear in mind the following facts:—

(1) *Arithmetical truths must be taught by demonstration.*—The well-known educational axioms, “Proceed from the known to the unknown” and “From the concrete to the abstract”, are specially applicable to this subject. In the first steps the child’s introduction to Number must be through the senses of *sight* and *touch*. •

(2) *The same truth must be presented in a variety of forms.*—Any stereotyped form of statement is fatal to true progress. The child must not only know that 20 from 30 leaves 10, but that the *difference* between 20 and 30 is 10; that 30 is 10 *more* than 20, that 20 is 10 *less* than 30, &c.

(3) *One truth must be well mastered before another is attempted.*—

In this subject especially the teacher's motto must be "Hasten slowly". Allow the child time to become conscious of his own power before urging it forward.

(4) *Advance must be gradual.*—Too much must not be attempted at any one time. The advance at each stage must be so slight as to be almost imperceptible; the child must walk, not run. "Slow and steady wins the race."

(5) *Revision must be frequent.*—Feverish haste results in premature break-down. Having climbed the hill pause to survey the road along which you have travelled, and gain fresh strength to encounter the difficulties which still lie ahead.

The young teacher is too prone to rush ahead in order to show progress, forgetting that if the foundation be not secure the whole superstructure built on it must, sooner or later, topple over.

Little children require frequently to retrace their steps that they may keep in mind the road by which they have travelled.

(6) *The questions must be practical.*—The child must feel an interest in what it does; this will be the case if it perceives that the knowledge it is gaining helps it in its games, in its dealings with its companions, in its errands for mother, &c. In the earliest stages the questions should apply to things by which it is surrounded, things in which it feels an interest, such as its pets, its playthings, &c.

6. Infant Arithmetical Training.—Right methods are all important; future success depends wholly on the foundation laid in the infant school. The pernicious practices sometimes taught or allowed in the infant school become so firmly ingrained that they are most difficult to eradicate when the child reaches the senior school. That this is the case is shown by the finger-counting too often observable even in some of the senior classes.

Many of these practices arise from a mistaken notion of what the proper work of an infant school is. "The chief object should be to train the children to see the simplest relations between numbers, and to deal readily with small numbers" (*Mr. Williams, H.M.I.*).

Since the Code prescribes no scheme of work, but leaves the teacher to do what she feels best for her little ones, some teachers think it is necessary for them to teach *slate* arithmetic dealing with hundreds, &c., of the value of which these

little ones have no conception. To such teachers we would commend the following extract:—"Arithmetic often (in the lower standards of *senior* schools) becomes a mere abstract or mechanical exercise, and is not made to rest upon simple questions of common life within the knowledge and observation of the scholars, nor is it always sufficiently an exercise in reasoning" (*Circular* 332); and add in the words of *Circular* 322—"It is the experience of many good teachers that by the adoption of such methods (*kindergarten*) it is found to be unnecessary before the sixth year is passed . . . to do any formal arithmetic work on slates".

The principle of teaching applicable to the infant school, "learn by doing", well defines the limit of arithmetical work at this stage; knowledge must be the result of *experience*; every operation must be performed by the child; all arithmetical progress must be the result of "the observant use of the organs of sense, especially those of sight and touch" (*Circular* 322). Hand and eye are the instruments of progress.

7. A Suitable Infant Syllabus.—Infant school teachers would do well to study "Course B" arithmetic for Standard I.; for it is drawn up on the same principle as should regulate their work. From this it will be seen that a child who is ready to pass into Standard II. has never been called upon to deal with any number greater than 99.

The lack of wisdom, therefore, in requiring infants to deal with hundreds and even thousands, is at once apparent.

The following syllabus, well mastered, will be an ample preparation for the senior school:—

Third Class.—The simple relation of numbers to 5. Notation to 5. *Counting* objects to 20.

Second Class.—The simple relation of numbers to 10. Notation to 10. *Counting* objects to 50.

First Class.—The simple relation of numbers to 20. Notation to 20. *Counting* objects to 100. Value of money to 20 pence. Ability to deal with questions relating to the foot, yard, day, week, pound, ounce, dozen, score, &c., in which the numbers do not exceed 20.

When work is based on a syllabus such as this, the children must be prepared to show how results are obtained, and to solve the question before the class with concrete objects.

Questions involving the principles of addition, subtraction,

multiplication, and division may be given at each stage within the prescribed limits.

The quickness and dexterity shown will form an important factor in judging the success of the teaching.

The children should be trained to give their answers in complete sentences.

Children who show proficiency in the work of the above syllabus, are far better prepared for the work of the senior school than those who are able to mechanically work difficult sums on slates without *understanding* any of the operations involved.

8. Specimen Questions (*Second Class*).—It may help the young teacher better to grasp the scope of the work, if we give a few specimen questions confined to one number (8) to show the great variety of forms in which the question on such a simple number may be stated. Even these may be easily extended.

Addition and Subtraction—

(1) 5 boys and 3 girls sit on a form. How many children are there?

(2) John has 5 marbles. His three brothers each gave him 1. How many marbles has he now?

(3) I have 8 children. 5 of them are boys. How many girls are there?

(4) 3 apples are on a plate. I place 5 more apples there. How many apples are on the plate now?

(5) A blind man has 3 pennies. 5 little girls each gave him 1 penny. How many pennies has he now?

(6) 8 children are each to have a book. I have given a book to each of 3 children. How many more books have I to give away?

(7) John has 8 marbles and Willie has 5. How many marbles has John more than Willie?

(8) Rose wants to buy a doll which costs 8 pennies. She has only 3 pennies. How many more pennies does she want?

(9) On a plate were 8 cherries. Willie took 5 of them and Jack took 3. How many cherries were left?

[The reader will see that in the above questions we have dealt only with the components 5 and 3; as many similar questions may be asked with respect to each pair of components, 7 and 1, 6 and 2, 4 and 4.]

Multiplication and Division—

(10) 3 boys each buy a penny bun. How many buns do they buy altogether?

(11) I have 8 pennies. To how many boys can I give 1 penny each?

(12) I bought 2 balls which cost 4 pennies each. How many pennies did I spend?

(13) Mother gave me 8 pennies to buy sugar which cost 4 pence for 1 pound. How many pounds of sugar did I buy?

(14) How many farthings are there in 2 pennies?

(15) I gave 2 apples to each of 4 little girls. How many apples did I give away?

(16) There are 8 sweets in my hand. How many little girls can each take 2 sweets?

(17) On this table were 8 pencils. 4 boys came and between them took them all. Each boy took the same number. How many pencils did each boy take?

(18) Here are 8 halfpennies. How many pennies will you give me for them?

(19) I have 4 pennies. To how many girls can I give a halfpenny?

Fractions and Multiples—

(20) Here are 4 oranges. I cut each in halves. How many halves have I?

(21) A butcher sold half a pig to each of 8 persons. How many pigs did he sell?

(22) Here is a packet of sweets. I take a half of them. What part is left for you?

(23) If I have 4 sweets in my share, how many sweets have you?

(24) How many sweets were there in the whole packet?

(25) What number is the half of 8?

(26) How many twos are there in 8?

(27) I divide 8 oranges among 4 little boys. How many oranges does each boy get?

(28) What part of 8 is 2?

(29) I cut away a quarter of a cake. What part of the cake is left?

(30) A quarter of a cake is worth 2 shillings. What is the whole cake worth?

Mixed Exercises—

(31) I have 8 pennies and buy 2 tops at 3 pence each. How many pennies have I left?

(32) 3 boys and 2 girls were sent home, and then there were 3 girls left. How many children were there at first?

(33) A boy has 8 marbles. He keeps 2 marbles for himself, and gives the rest to John and William. How many marbles does each get, if each has the same number?

(34) 2 girls have 2 pennies each, and 4 boys have 1 penny each. How many pennies have they altogether?

(35) On Monday and Tuesday I had 3 sums right. On Wednesday I had 2 sums right. How many sums did I get right in the three days?

[The teacher will see that questions 31–35 are based upon $3 + 3 + 2 = 8$; other series of numbers as $5 + 2 + 1$, may be used in the same way.]

9. Difficulties to be Encountered.—“Fore-warned is fore-armed”; the young teacher will, therefore, do well to become acquainted with the difficulties which the subject presents, so that means may be devised for overcoming them. The chief difficulties which face the infant teacher are:—

(1) **Conveying the idea of Number in the Abstract.**—At first the child has no conception of the meaning of 2. It understands what is meant by 2 apples, 2 books, &c., but not 2.

Questions in abstract number should not be given below the upper part of the middle division; and then only immediately after dealing with the same numbers in the concrete.

(2) **Associating Number with its Arbitrary Sign.**—This is a further step in advance. The child has not only to recognize number in the abstract, but its sign has to *recall* the idea of number associated with it.

(3) **Teaching the Principle of the Decimal System of Notation.**—This always proves a stumbling-block, and too often no attempt is made to teach it. After having learnt to associate a particular value with each of the 9 digits, the child then has to further learn that this value varies according to the *position* of the digit. The 1 no longer represents one unit only, but when associated with another figure and placed to the left of it, it represents 1 ten or 10 units.

(4) **Fixing in the child's mind the Relation and Properties**

of Number, so that it can quickly, accurately, and intelligently perform the operations of addition, subtraction, multiplication, and division.

Do not despise these difficulties; they are very real ones. The battle of the science and art of arithmetic is to be fought and won in this limited curriculum. *How* the child is taught, is of the utmost importance to future success. The tender age of the pupils but increases the difficulty and makes thoughtful preparation and skilled teaching all the more necessary.

10. Dangers to be Avoided.—Experience shows that much of the want of success in this subject of infant school instruction, is due to one or more of the following:—

(1) *Too great a hurry.*—To the young teacher, half a dozen lessons devoted to teaching number 2 to the Babies' Class, appears a great waste of time. The work is so extremely simple to them, that they think it must be so to the Babies also.

(2) *Want of appreciation of children's difficulties.*—Because the little one knows that 1 apple and 1 apple are 2 apples, the teacher takes it for granted that the child should be equally able *at once* to tell that 1 cat and 1 cat are 2 cats. If this step is mastered, then the child must equally know, *without being taught*, that given 1 apple, 1 apple more is wanted to make 2 apples.

But each of these points presents a real difficulty to the little ones we are considering, and it requires skilled teaching to bring these elementary truths home to the limited intelligence of these little children. The teacher should *demonstrate everything*, and take nothing for granted.

(3) *Mechanical methods.*—The temptation to adopt these is very great; the right methods are so long and laborious; mechanical methods will produce a certain class of *results* with such comparative ease. This is the danger; *results*, not *training*, too often become the teacher's aim. The fingers are always within reach; it is so easy to produce results by counting them, and it can be done behind the back, so is not seen.

How comparatively easy it is to teach addition by counting the panes of glass in the window, or by counting nine children placed in the front row. But if the Inspector make these conditions impossible by requiring hands to be placed on the head in full view, by removing the class out of sight of the window,

or by removing some of the children from the front row, a more or less complete collapse follows. What benefit do the children derive from such teaching?

(4) *Want of uniformity of system.*—The children have just given an answer to a simple arithmetical question, and the Inspector turns to the teacher and asks "How did they work that?" and the reply comes "In their heads". If the Inspector be not satisfied, and again ask "But how?" too frequently, in the case of young teachers, the answer comes "I don't know".

Here there has evidently been *no* systematic teaching; a few bright children have remembered points of a number of miscellaneous lessons.

Occasionally there is no one definite system recognized and made compulsory throughout the school. Each teacher is allowed to teach the method she prefers, with the result that when children are promoted, all the work has to be done over again before the new children can make any progress.

(5) *Lack of sufficient concrete illustrations.*—There must be one system of *teaching*; but when the truth is once grasped by means of the system adopted, *then* an abundance of other concrete objects should be used to impress the fact.

(6) *Allowing knowledge to slip.*—When knowledge is once acquired it should never be allowed to fade, but should be kept fixed in the mind by frequent revision. Isolation of the rules is accountable for this both here and in the senior school.

II. Apparatus Used.—Among the apparatus used in teaching Number are the following:—

(1) **The Ball-frame or Abacus.**—This is a square wooden frame across which are 10 wires (formerly 12), and on each wire are 10 balls (formerly 12) variously coloured. In the best of these there is a sliding black-board hiding the balls not required, and on which figures can be written.

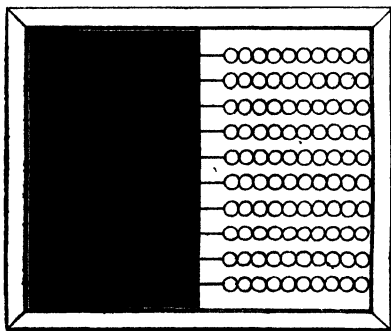
The frame should be large and the balls bright; and the children should be able to see only the balls with which the question deals.

If the system of teaching be based upon the ball-frame, the children *must* have frames which *exactly correspond*. Demonstration is not sufficient; the child must itself *handle*.

This piece of apparatus has been long in use. It has the advantage of presenting Number in the concrete. If the children are supplied with similar frames, it allows the operations

to be performed by both teacher and pupil. It also helps to explain the decimal system of notation.

It does not, however, possess the advantage of associating a definite form with each number, sufficiently distinct to enable the children to differentiate one number from another when the balls are removed out of sight; consequently the operations connected with each number must be committed to memory; and if the result be forgotten, the child has no mental picture by which it may be recalled. Children work well whilst the balls



are in sight, but when they are removed a great difficulty is often felt.

Unless the frame is provided with the black-board slide there is no means of associating the sign with its concrete representation.

(2) **Number Pictures.**—This system of teaching Number is recommended by the Department in *Circular 322*. Its great distinctive advantage over other systems is that *each number is represented in the concrete by a definite shape*, which is impressed on the memory, and can be used when the pictures themselves are withdrawn.

These pictures may be made with cardboard tablets, cubes, shells, &c., by the children themselves. The advantages of the system will be seen from a description of the leading features of one of the most effective:—

“The Vivid Arithmetic Sheets for Number-Laying”—

1. The Number-Pictures are printed in colours, and hence are bright and attractive to the little ones.

2. The value of each of the numbers 1 to 20 is impressed on the memory by a distinct mental picture.

3. The difference in the value of numbers is 'at once apparent to the eye.

4. In each Number-Picture the concrete and the abstract are combined.

5. The Number-Pictures allow all the components of the number to be vividly shown, both in the concrete and the abstract, so that—

(a) The truth of the equality of each pair of components with the number itself, is self-evident to the eye.

(b) The picture of each pair of components is so vividly impressed upon the mind through the eye, that the mention of one component immediately recalls the other.

6. The Number-Pictures represent pictorially our system of notation. (See p. 202.)

7. The Number-Pictures can be easily reproduced by the children with coloured tablets, forming a kindergarten occupation.

8. The Number-Pictures illustrate pictorially the processes of the four simple rules.

These points will be understood by referring to the coloured plate annexed, and to page 202.

(3) **Miscellaneous Articles.**—Concrete illustrations of any kind may be used for teaching, *e.g.* sticks, both single and tied in bundles of 10; buttons fastened on cards, marbles in bags, counters, &c.

12. Two Methods of Teaching Addition and Subtraction.—Omitting the plan sometimes followed of allowing children to arrive at the result by the mechanical process of solving each question by counting in units, there are two recognized methods—

(1) **By means of the Components of Numbers.**—The components of all numbers to 10 are thoroughly impressed by means of the pictures of Number which the children themselves make with coloured tablets. In dealing with numbers above 10 the child always *works through the 10* where this is necessary, making use of the components already learnt.

The picture tells the child that 3 and 2 are 5, and that 3 from 5 leaves 2.

SPECIMENS

TO ILLUSTRATE THE TREATMENT OF NUMBER IN
THE VIVID ARITHMETIC SHEETS.

FIG. 1.



FIG. 2.

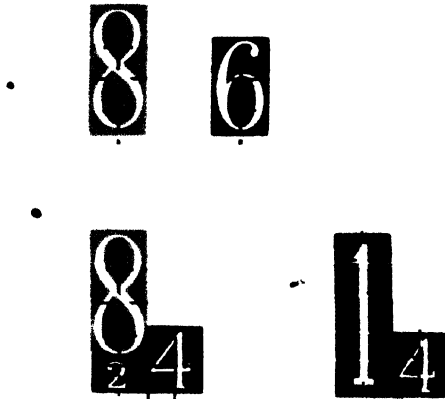


FIG. 3.



In adding 13 and 2 the child makes use of this knowledge, and says 3 and 2 are 5; 1 ten and 5 are 15.

So in 3 from 15, the child takes the three from the 5 leaving 2; which with the 1 ten gives the required answer 12.

This is all pictorially represented and is easily grasped by the children.

A few numbers require the working *through the ten*, e.g. $7 + 5$. The child knows that 7 and 3 make 1 ten, and 2, the other component of 5, placed beside this, gives the answer 12. This decomposition of 5 is pictorially shown, as well as the final result.

Fractions and multiples are also graphically represented and taught in connection with each number. (See p. 209.)

The elements of the multiplication and division tables, as well as the processes of multiplication and division, are thus taught in connection with the operations of addition and subtraction.

The advantages of this method of teaching are—

(a) In the earliest stages the child always deals with *small* numbers, the concrete representation of which he can handle and apprehend.

(b) The four rules are taught *together*, and thus the relation of one to the other is better recognized and impressed; moreover, greater scope is given for a variety of questions, which excite and maintain interest.

(c) Results are not obtained by *counting in units*, a practice so difficult to eradicate when once acquired.

(d) The operations connected with the working of the four rules strengthen the child's grasp of the decimal system, and make subsequent work intelligent and easily acquired.

(e) The memory is not taxed to as great an extent as in the other systems.

(f) Calculations are performed with greater ease and accuracy when once the method is grasped.

(2) By means of the Tables.—When this system is followed, the addition and subtraction tables must be committed to memory to $10 + 10$, and $20 - 1$.

But even then there is a *new* step to be learnt before higher numbers can be dealt with, e.g. $19 + 7$. The child first has to find from the tables that $9 + 7$ are 16, and then that 10 and 16 are 26.

So with 9 from 26; the child must find from the tables that 9 from 16 leaves 7, and then that 10 and 7 are 17.

From this it will be seen that the tables are only serviceable in dealing with the smaller numbers; and that a fresh principle must be taught when we wish to teach the addition and subtraction of numbers above these.

Where this system is adopted the addition and subtraction tables should be taught *together*, not separately, as is too often the case.

Column (a) and column (b) should be *constructed*, side by side, and committed to memory.

(a)				(b)			
1	1	1	1	2	3	4	5
1	2	3	4	1	1	1	1
—	—	—	—	—	—	—	—
2	3	4	5	1	2	3	4
==	==	==	==	==	==	==	==
&c.				&c.			

These tables must be constructed from direct observation of objects, and not simply written and committed to memory.

The system requires less skill in teaching, and if the table be thoroughly known, any result contained in it can be recovered, if forgotten, by mechanically repeating the table through till the required number is reached.

The system is a burden on the memory, and in the higher numbers has as we have seen, to be supplemented. Unless the child has learnt the tables so thoroughly that any result is at once able to be given, the whole table has to be gone through, and the answers are obtained very slowly. The usual practice is first to teach the addition of 1 to each digit; consequently babies, at the very threshold of arithmetical work, have to deal with a large number like 10, which is not so readily represented in the concrete.

The teacher should carefully weigh the merits of the two systems; but having once decided which is considered preferable, this should be adhered to and worked systematically. We prefer the component system as being more educational and thorough.

13. Numeration and Notation.—Number may be expressed either by words or figures, *e.g.* ten, 10. When we teach children to express Number by *words*, we teach **numera-**

tion, but when Number is expressed by *figures*, this is called **notation**. It is evident, therefore, that numeration may be expressed orally or in writing; at the stage we are considering, the work is all oral.

When a number of objects are placed before children, and they are required to count them or in some other way to estimate their number, this is an exercise in *numeration*; if the child is required to express the number by a figure on its slate, this is *notation*. It is evident, therefore, that numeration and notation should be taught concurrently. When the idea of the number is developed, this should at once be followed by the *sign* which expresses it.

The style of figure in the lowest class should be of the simplest possible character, and made within squares or oblongs, *e.g.*—



In teaching the notation of numbers above 10, the "place value" of the ten's figure should be indicated by an increase in the size of the figure. At first the relative value of the figures may be indicated roughly by drawing them to scale on the squared side of the black-board, *e.g.* 13 would be represented by a 1 drawn along the sides of ten squares, and the 3 by a figure occupying the height of three squares.

14. The Teacher and her Class.—The arithmetic lesson is a good test of the ability of an infants' teacher. A bright, cheerful, sympathetic manner is a great help in securing the interest of every child; this must be attained, because where there is no interest there will be no self-effort, an indispensable condition of successful teaching. An alert teacher will *distribute* her questions well throughout the class so as to keep all at work, and will not take the answers of a few forward children alone; she will remember *individual* children's points of difficulty, and will never be tired of demonstrating and presenting the *same* point under a variety of aspects, so that it may become firmly impressed; and she will *revert again and again* to questions which have occasioned difficulties.

Emulation will be aroused and the children stimulated to work, by placing on one side of the class a few of those who answer *well*, to be appealed to only when the answer is not to

be obtained from the other members of the class. *Backward children* will be placed where they are always directly under the teacher's eye, and a large proportion of the questions will be addressed to them.

Number, taught by means of Pictures as an *occupation*, enables the teacher to see that *each child is at work*. Since the result of each operation worked by the children is before them, if the answering is not general it must spring from lack of skill on the part of the teacher.

15. Arithmetic as an Aid to Language.—The arithmetic lesson is well adapted as an aid to language; for it requires the statement of facts which have come under the direct observation of the child, and of the results which have been worked out by its own efforts. Even in the Babies' Class, answering in complete sentences should be cultivated; this can be obtained only by *imitation*. The teacher does a certain action, and the children imitate the *action*. The teacher then states in as short a sentence as possible what has been done, and the children *repeat the teacher's statement*. The teacher and children now repeat the action *together*, and the children make the statement descriptive of the action, *e.g.*—Let us suppose counting from the ball-frame is being taught, and that the teacher shows one ball. The children should not say "One", or even "One ball", but "I see one ball". When another ball is added, the children say "I see two balls"; and so on.

On a future occasion, when the same process is repeated, *another* form of statement should be taught, *e.g.* "There is one ball", "There are two balls", &c.

In this way the arithmetic lesson may be made to yield valuable training in clear and exact statement of the simple facts which come directly under the observation of the children.

16. A Counting Lesson for Babies.—Before formal lessons on the relation and properties of Number are attempted, the children should be made familiar with the **names** of the numbers to be used; this may be done by means of lessons in counting.

To be successful in this exercise the *children* must be supplied with objects *similar* to the teacher's; there should be as **great** a variety of objects as possible. The children must *imitate at the proper time* the teacher's actions and words.

TO COUNT TWO.

First step. Conversation on the Articles used.—Whatever is to be counted should first be talked about, so as to arouse the children's interest in it; *e.g.* The colour and shape of the tablets in Number-laying, the balls in Gift I., or the beads of the ball-frame.

Second step. Counting Collectively by Imitation.—The teacher takes up a red square and holds it before her; the children imitate the action. She then lays it on the desk or slate and says, "I have one red square". The children imitate the teacher's action and repeat her words. Another square is then taken up by all and laid on the desk, and the children repeat after the teacher, "I have two red squares". The same process will be repeated with the blue squares, and then with the brown.

In the same way the children will count their thumbs, ears, arms, hands, eyes, &c., until the actions and words have become quite familiar.

Third step. Collective Counting without the Teacher's aid.—The teacher asks the children to count out two red squares, two blue, or two brown ones. To count their thumbs, eyes, ears, &c. This they do, accompanying each with the same actions and words as in the second step, except that on this occasion the work is done *without* the assistance of the teacher.

Fourth step. Individual Counting.—Children are now called on *individually* to perform any of the above exercises, and to accompany them by the appropriate action and words.

Fifth step. The Recognition of Number.—The object of this step is to accustom the children *mentally* to count with rapidity the number of articles placed before them, and quickly to recognize a given number of things at sight. The teacher holds up two of any article, *e.g.* two pencils, and the children at once say, "I see two pencils".

Individual children are then asked to come and select *two* out of a number of articles, *e.g.* two oranges. As each is taken, words expressive of the action should be used, *e.g.*—

"I have one orange". "I have two oranges".

17.

A LESSON ON NUMBER 2.

A. Taught by the Ball-Frame.

Apparatus.—Each child to have a ball-frame similar to the teacher's. Plenty of miscellaneous objects, such as buttons, pencils, sticks, &c.

First step. Counting.—The *counting* lesson on *two* is first revised by requiring the children to count out—first collectively, then individually—two red, two blue, or two white beads.

Second step. Development of the idea, $1 + 1 = 2$.—The teacher sets out one red bead, and the children *imitate* the action and say, "I have one red bead". The teacher places a blue bead on the same wire; the children imitate and say, "I have one blue bead". The teacher then places the two beads *close together*, and the children imitate. The beads are then counted, and the children say, "I have two beads".

The beads are then *slightly separated* by teacher and children, and all repeat, "One red bead (*touch the red bead*) and one blue bead (*touch the blue bead*) make two beads (*bring both beads together again*)".

Repeat the same exercise with beads of other colours. Place figures to represent the process on the black-board. The teacher now gives exercises with various articles placed before the children.

Third step. Development of the idea, $2 - 1 = 1$.—The teacher shows two red beads; the children imitate and say, "I have two red beads". The teacher now places her hand on one bead; the children imitate and say, "One bead taken from two beads (*here the bead is drawn away and covered with the hand*) leaves one bead".

This exercise is repeated with beads of another colour. Place figures on the black-board to show the operation. The teacher now gives exercises with various objects placed before the children.

Fourth step. Development of the idea, Twice $1 = 2$.—First teach that *twice* means 2 times. The teacher strikes the bell and asks for the number of times it was struck. The children say, "You struck the bell *once*". The teacher then strikes the bell twice slowly, and the children say, "You struck the bell

twice". The children are now told to hold up their hands *twice*, to shut their eyes *twice*, &c., until the meaning of this word is thoroughly grasped.

The teacher then shows one red ball; the children imitate and say, "I show one red ball *once*". Another red ball is then placed forward by all, and the children say, "I show one red ball *twice*". The balls are then counted, and the children say "*Twice* 1 are 2".

Numerous similar exercises are now given.

Fifth step. Development of the idea that 1 is contained in 2 twice.—The teacher and children show 2 red balls and say, "I have 2 red balls". One ball is now covered with the hand and the children say, "I take away one ball *once*" (*here the ball is thrown back*). The hand is now placed on the other ball and the children say, "I take away one ball *twice*. 1 ball taken *twice* from 2 balls leaves no ball".

Repeat the same exercise with other articles.

Sixth step. Miscellaneous Exercises.—A number of questions will now be given bearing on the work taught, but relating to other objects.

Note.—The young teacher must not suppose that the above sketch would form *one* lesson; it may profitably be spread over five or six lessons. •

B. Taught by means of Number-Pictures.

As our space is limited, we must refer the reader to pp. 17–22 of "Hand and Eye Arithmetic" for a full lesson on "Number 2", taught through number-pictures, as well as for a complete course of arithmetic lessons, covering the whole work of the infant school, from the Babies' Class upwards.

18. The idea of Number in the Abstract.—No attempt should be made to deal with Number in the abstract until at least the upper portion of the middle division of the school is reached.

From the variety of objects we have used in our previous lessons, always with an exactly similar result, the children have been unconsciously grasping the idea we wish to convey. A few lessons combining the concrete with the abstract, and using the latter occasionally as though *an abbreviated form* of the former, will soon accustom children to using Number in the abstract.

Count out and arrange 5 *red* squares in the form of picture 5; then 5 *blue* squares, then 5 *brown* ones.

When all have been arranged in the correct form, count each and say—



- (a) 1 red square, 2 red squares, 3 red squares,
4 red squares, 5 red squares.

Follow this by counting the same squares, saying only—

- (b) “1 red, 2 red, 3 red, 4 red, 5 red”.

And follow this again by—

- (c) “One, two, three, four, five”.

Perform a similar exercise with the blue tablets and then with the brown ones.

Now perform arithmetical calculations first in the concrete and then gradually in the abstract, *e.g.*—

- (a) 1 red square from 5 red squares leaves 4 red squares.
(b) 1 red from 5 red leaves 4 red.
(c) 1 from 5 leaves 4.

If the work be done in stages, as we have suggested, the transition should not prove difficult.

A reference to the coloured plate at p. 192 will show that on the “Vivid Arithmetic Sheets” the same operation is shown both in the concrete and the abstract, thus accustoming the children from the first to both methods of statement, and greatly minimizing the difficulty.

19. The Association of Number with its Arbitrary Sign.—This is usually a difficulty with young children, but when Number-Pictures are used no trouble is experienced; for from the first *the abstract sign has formed a part of the concrete representation* of the number: the one cannot be recalled without the other. The fact that the figures are all *drawn to scale* is a great help in enabling the children to associate the right relative value with a given sign.

Where Number-Pictures are not in use, the next best substitute is the black-board slide on the ball-frame, because by its use the figures are brought as near as they can be to the concrete representation of Number. If the ball-frame has no black-board slide, then it should be hung on the ordinary school black-board, on which the figures representing the different concrete values should be placed.

The close association of Number in the concrete with its abstract sign is of very great importance.

20. Fixing the Relationship of Numbers.—The specimen lesson on p. 197 shows how we think the idea of Number should be conveyed and *fixed at the time*. Too many young teachers forget that in order to make impressions *permanent*, and the children ready and skilful in manipulating numbers, the lessons must be **repeated again and again**, and some *permanent record of the results obtained* be always available in a form understood by the child, so that it may refer to it when in doubt or difficulty. Such a record the Number-Pictures admirably supply.

To remove a crutch whilst the child still needs its support is a great mistake; for if a child does not know the required result, and has no means of discovering it, a *guess* is the natural consequence. Once the habit of guessing is acquired, it is fatal to progress. Whenever a *wrong* answer is heard it does harm to the whole class, for it tends to make the children doubtful of their own knowledge; and, moreover, the wrong result may be fixed in a child's mind by hearing it given.

Children will not use such "helps" unless they really need them. If the need is felt, then the more the "helps" are used the better for both teacher and scholar; for every time a child looks at the picture of a pair of components its knowledge is deepened. We therefore strongly advise that new work should be introduced sparingly, and that previous work should be *constantly* revised.

21. The Principle of the Decimal System.—All calculations involving the use of numbers beyond 10 are performed with much greater ease, if the child thoroughly grasps the principle of the tens system.

Children in the infant school must thoroughly understand the "place value" of the digits 1 and 2, and be able to tell immediately that $14 = 1 \text{ ten} + 4 \text{ ones}$; $15 = 1 \text{ ten} + 5 \text{ ones}$. If this be once grasped a very large proportion of the addition and subtraction of numbers between 10 and 20 is but the revision of the components of numbers to 10; and additions such as $20 + 30$, or $50 + 40$, are seen to be but the addition of 2 and 3, or 5 and 4, *applied to a different unit*.

22. Numeration and Notation of 10 to 19.—This should be well taught before attempting calculations involving the use of any of these numbers. The whole need not be attempted in one lesson, but just as much as the teacher thinks can be accomplished with thoroughness and ease.

AN OUTLINE LESSON:

A. BY MEANS OF NUMBER-PICTURES.

Apparatus.—"The Vivid Concrete and Abstract Arithmetic Sheets" and the "Vivid Tables for Number-Laying".

[N.B. *Number 10 is supposed to have been taught without any explanation of the value of the 1 or 0.*]

First Step. 'The New Pictures introduced—
Numeration:

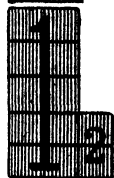
(a) Each child is called on to make picture 10 in *brown* tablets.



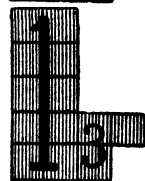
(b) Picture 1 is placed beside it, and the children count one and say picture 10, **picture 11**. Point out on the sheets.



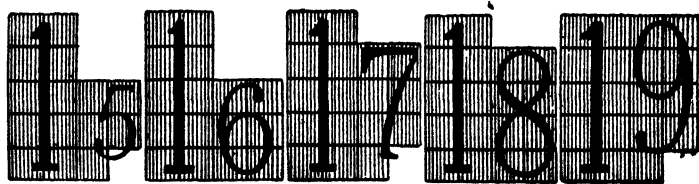
(c) Another picture 1 is added, and the children count on and say **picture 12**. Point out on the sheets.



(d) Another picture 1 is added, and the children count on and say **picture 13**. Point out on sheets.



This is repeated until picture 19 is reached and formed, and each has been pointed out on the sheets.



Now practise the children in—

- (1) Laying by counting any number asked for.
- (2) Pointing out any number on the sheets.

[N.B. *The figures are not placed on the tablets till the next step.*]

Second Step. The Pictures examined—Notation:

- (a) The children are led to examine picture 11, and to note that it is made up of picture 10 and picture 1.

Similarly, picture 12 is examined, and found to consist of picture 10 and picture 2.

Each of the other pictures is examined, and the presence of the picture 10 noted.

- (b) The children again examine picture 11. Figure 1 is placed on picture 1. Picture 10 is now left to be named by a sign. The teacher produces 10 tablets stuck on a sheet of cardboard, and, by comparison, shows this piece of cardboard is an exact counterpart both in size and shape of that part of picture 11 for which a sign is needed; the only difference is that the picture is in *one* piece instead of 10 pieces. We can therefore substitute this *one* piece for the 10 small squares.

The children are led to see that a pillar is made up of many bricks, but yet these form only *one* pillar. They now grasp that the appropriate sign for the ten tablets joined together is 1. But a 1 of the same size as is placed on picture 1 evidently would not do.

Since there are 10 squares in the picture we want a figure *ten times as large* as this 1 unit. The teacher shows such a figure, and calls it **1 ten**.

Picture 11, therefore, consists of, and is represented in signs by, 1 ten and 1 one (or unit).

The children place the appropriate sign on each part of picture 11. The number is now drawn to scale on squared slates, the 1 ten passing through *ten* squares.



- (c) Picture 12 is next examined, and the 1 ten substituted for the 10 separate tablets; its sign is then placed upon it by the children. Picture 2 is left, and figure 2 is therefore placed upon it, giving the correct mode of representing the notation of 12.

The children write 12 on the slates as before, drawing the figures to scale.



- (d) Each of the other numbers is examined, and the appropriate signs for its representation determined.
- (e) The children are now led to see the meaning of the 0 in 10: it shows the *absence* of the unit's figure. Lead children to see that big boys and girls when they write a number make all the figures the same size, and that therefore this 0 is wanted to put us in mind that the 1 is 1 ten.
- (f) The children point to each picture, and say—
 Picture 1 ten and picture 1 make picture 11,
 „ 1 ten „ 2 „ 12,
 „ 1 ten „ 3 „ 13, &c.
- (g) Reverse the process and say, whilst pointing to the picture—
 Picture 11 is picture 1 ten and picture 1,
 „ 12 „ 1 ten „ 2,
 „ 13 „ 1 ten „ 3.
- (h) When this is well known, the word “picture” may be dropped, and the children say simply—

1 ten and 1 make 11,
 1 ten „ 2 „ 12,
 1 ten „ 3 „ 13.

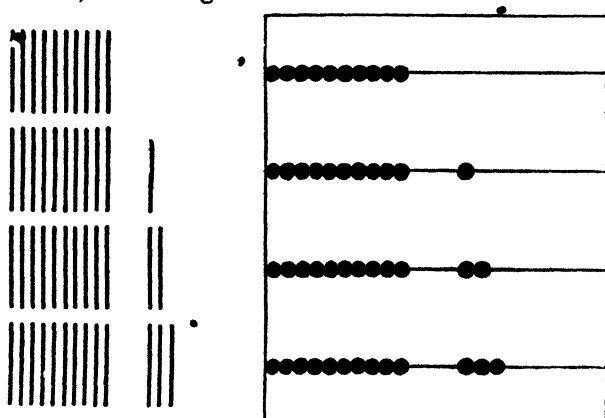
Third Step. Exercises:

- (a) The children *lay* any number named by the teacher.
- (b) The children *write* any number represented by the teacher in the concrete.
- (c) The children represent by cardboard figures or by *writing* any number named.
- (d) The teacher shows picture 10, and asks for the other picture to make any number named, e.g. 15, 11, &c.

B. BY MISCELLANEOUS OBJECTS.

Apparatus.—Sticks or the ball-frame for both teacher and children.

First Step. Counting—Numeration.—The children by imitating the teacher count out ten, eleven, twelve . . . nineteen sticks, and arrange them thus:—



Second Step. The Numbers examined—Notation:

- (a) To give the idea of 1 ten the teacher ties the ten sticks into one bundle, or places the ten beads close together.
- (b) By careful teaching, the fact is impressed that though there are ten sticks in the bundle or ten balls on the frame, there is only *one* bundle or *one* set of balls.
- (c) Each of the numbers is then examined, and the 1 ten pointed out in each.
- (d) When this is noted, each of the numbers is again examined, and the children say after the teacher—

1	ten	and	1	one	make	11
1	ten	„	2	ones	„	12
1	ten	„	3	„	„	13
.	.	.	&c.	.	.	.
1	ten	„	9	ones	„	19.

- (e) Let a child come to the front and arrange each number learnt. As it lies before the children the teacher shows how it is represented on the black-board.

Tens.	Ones.
1	1
1	2
1	3
...	...
1	9

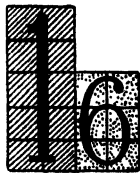
As an additional aid it will be well to make the tens figure *ten times the size* of the units figure 1. Teach the use of the 0 in 10.

- (f) Practise the children in reading these numbers from the black-board.

Third Step. Exercises.—These are exactly the same as in the Third Step of the previous lesson.

23. Calculations involving the use of Numbers 10 to 19.—Success here depends upon the grasp the children have acquired of the composition of these numbers. If to every child in the class 16 is not *units* only but two separate pictures 10 and 6, which can be dealt with *independently*, then one part of the new stage of work will give no trouble.

But until this much has been taught and *understood*, and the concrete representation is so vivid that it can be *mentally pictured*, no satisfactory progress can be made. By the use of red for the 1 ten and blue for the 6 units the number-pictures make this mental picture very clear and distinct.



We strongly advise that in dealing with numbers above 10 two stages of work be well observed, as the processes are quite distinct—

- (a) **Addition and subtraction of numbers which can be added to or taken from the units figure without decomposing the 1 ten or forming another 1 ten.**

To a child who has a thorough grasp of 16 as 1 ten and 6,

there is no difficulty presented in the **subtraction** of any of the numbers 1, 2, 3, 4, 5, or 6 from it; for the child at once sees that it need concern itself *with the units part only*, and then add the 1 ten to the result.

2 from 6 leaves 4; which with the 1 ten makes 1 ten 4; that is 14.

These operations should be performed with the concrete representation lying before the children, so that what is left is actually *seen*.

Everything should be done methodically: therefore the children should be taught to *describe in words* what they do, *e.g.* The children say—"2 from 6 leaves 4.

1 ten and 4 are 14".

Addition will be performed with as much ease, *e.g.* 16 and 3. Again this is but a repetition of 6 and 3 with the 1 ten added to the result. The children say—"6 and 3 are 9.

1 ten and 9 are 19".

We must remember that what seems so simple to us appears much more difficult to the child; the teaching should therefore be very thorough, and the progress not too rapid.

Each result should be obtained by the children themselves working with the Vivid Tablets, sticks, or ball-frames.

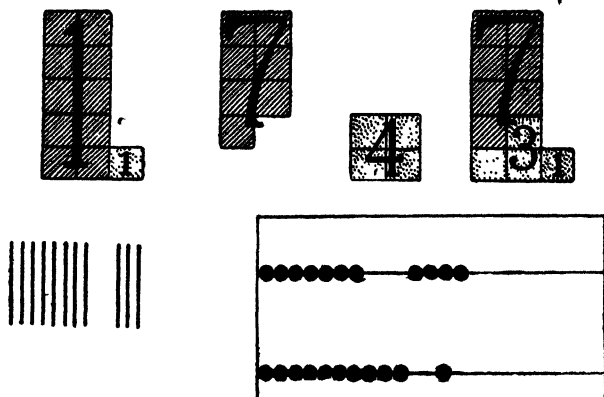
If the teacher be unable, from any cause beyond her control, to provide for this individual work *by the children*, then she herself, standing in full view of the class, and working with the tablets placed on a slate, should illustrate each point of the teaching.

(b) **Addition and subtraction of numbers which involve working through the ten.**

A child who has learnt the components of numbers to 10, especially those of 10 itself, is ready to proceed to this step; but we would urge a thorough revision of this earlier work before commencing.

Suppose the mental calculation is $7 + 4$. The child, with its tablets, sticks, or ball-frame before it, says, "Here are 7; how many more do I want to make 10?" The reply "3" is at once given. The first part of the answer, "1 ten", is thus obtained. When the 3 are taken to complete the ten there still remains 1. So the answer 1 ten 1 or 11 is obtained.

This will be arranged as is shown below, whichever means of demonstration is used.



The *reverse* process is followed in taking 7 from 11. The child says, "Here are 10. If I take away 7 from the 10, what will be left?" The reply "3" is made. This 3 added to the 1 unit makes the 4 required for the answer.

This stage is a little more difficult, but slowly and carefully worked the difficulty is easily overcome. Every process is shown on the Vivid Sheets in a form for permanent reference.

We would strongly urge the teacher to thoroughly master the process *in connection with one number*. The time thus spent is amply repaid by the rapidity with which children apply the process to subsequent numbers.

24. Fractions and Multiples.—This part of arithmetical teaching is, as a general rule, much neglected. It cannot be taught by any of those mechanical devices before alluded to, but is bound to be taught by demonstration.

Since this part of the work is essential to a clear understanding of the *principles* of multiplication and division, and also as an explanation of the way in which the *tables* of multiplication and division are constructed, it will repay careful instruction. The illustrations we now give will, probably, be a sufficient guide to the teacher, and suitable questions (20 to 30) will be found on p. 187.

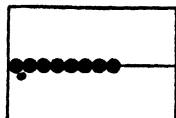
FRACTIONS AND MULTIPLES.

VIVID TABLETS.

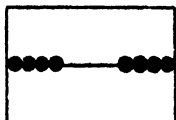
STICKS.

BALL-FRAME.

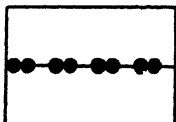
A.
The whole
number.



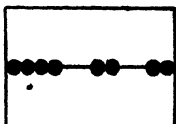
B.
(a) The half.
(b) $2 \times 4 = 8$.
(c) 4 con-
tained in 8
twice.



C.
(a) The quar-
ter.
(b) $4 \times 2 = 8$.
(c) 2 con-
tained in 8
4 times.



D.
The half
equals two
quarters.



25. Money and Common Weights and Measures.—
“Shopping questions” interest children, and are helpful in the little duties of their daily home-life; they should, therefore, be used as much as possible. The actual coins, or imitations of them, which can now be bought very cheaply, and the commonest weights and measures spoken of, must be seen and used by the class.

Each coin, weight, or measure should be introduced when teaching the number with which it is most appropriately connected; *e.g.* the **halfpenny** when teaching number 2; the **farthing** when teaching number 4; the **threepenny-piece** with number 6; the **shilling** with number 12; the **sixpence** when teaching the half of twelve; the **sovereign** with number 20.

The **inch** and the **foot** can be taught in connection with 12; the **ounce** and the **pound** in connection with 16; and so on.

Let one child be the shopkeeper and two or three others the customers, so that the work may be as realistic and practical as possible. To this end, deal with articles such as the children are likely to be sent by their parents to buy. The parents themselves will appreciate the instruction thus given.

26. Slate Work.—We do not deprecate this, if the sums given fall within the prescribed limits of *mental* work, and are given in a concrete form. Then they are a valuable test of *individual* ability, and one of which the teacher will do well to avail herself.

The careful teacher will prepare a series of sums, to correspond with each stage of the work; *e.g.* mental addition to 10.

4d.	2 nuts	1 top	1 pen	1 book	2 pins
2	2	3	3	2	2
3	5	2	1	4	3
9d.	9 nuts.	2	4	2	3
=	=	8 tops.	9 pens.	9 books.	10 pins.

These will *never* be dictated as *abstract* numbers, but in a concrete form; *e.g.*—

“I had 4 pennies in one pocket, 2 pennies in another, and mother gave me 3 pennies. How many pennies had I altogether?”

Only just sufficient time should be allowed for the average child to work the sum, after it has been taken down correctly, or children will be tempted to adopt some mechanical device in order to obtain the answer.

We have given a brief outline of the arithmetical work to be done in the infant school, but, knowing the difficulties the subject presents both to teachers and children, we are conscious more detailed help will be needed by the young teacher, if a systematic course of lessons is to be given. As our space is limited, we must refer teachers to *Hand and Eye Arithmetic* (Blackie & Son), where the teaching of every number, accompanied by a complete set of appropriate questions, is fully dealt with.

SUMMARY.

1. Arithmetic is taught for the mental training it affords, as well as for its practical value; both are demanded by the Education Department.
2. To produce successful arithmetical work the teaching must be by means of demonstrations with concrete objects; the same truth must be presented in many forms; advance must be gradual, revision frequent, and the questions practical.
3. Mental calculations dealing with small numbers to show the simplest relations between them, form the proper work of the infant school. The four simple rules should be illustrated.
4. The chief difficulties are to convey the abstract idea of Number, to associate Number with its arbitrary sign, to teach the "place value" of Number, and to fix in the child's mind the relation and properties of Number.
5. The teacher must avoid hurry and mechanical methods, and want of uniformity in the system of teaching. She must appreciate children's difficulties, and remove them by concrete illustrations.
6. The Ball-frame or Abacus and Number-pictures form the chief apparatus for teaching. A variety of miscellaneous objects may be used.
7. There are two methods of teaching Addition and Subtraction: (1) By means of the components of numbers; (2) By the Addition and Subtraction Tables.
8. Numeration and Notation should be taught concurrently.
9. The teacher must be a good class manager, and secure interest and individual work.
10. The arithmetic lesson should be utilized as a valuable aid to language.
11. Counting should familiarize the children with the names of numbers.
12. Abstract number should be treated as an abbreviated form of the concrete.
13. The arbitrary sign (figure) must be intimately associated with the concrete representation of number.
14. A permanent record of results obtained by the children should be accessible to them.
15. The children must grasp the principle of the "place value" of the digit.
16. The addition and subtraction of numbers beyond 10 fall naturally into two stages.
17. The principles of Multiplication and Division should be taught.
18. The children should be made familiar with the common coins and weights and measures.
19. Slate work is valuable as an individual test, but should not be in advance of the mental work.

GOVERNMENT QUESTIONS.

1. What methods would you adopt to give a young child the power of adding *by steps* and *not by units*?
2. Explain how you would make young children familiar with the right use of the figures 17 as the notation for seventeen.

3. Show which of the manual exercises of little children in infants' schools are helpful in teaching the elements of arithmetic, and say how you propose to use them.

4. State what you consider to be the chief objections to the use of "fingering" in arithmetic. In what sense may the habit be regarded as a misapplication of a sound method of instruction? Enumerate the means you would employ to restrict its use in young classes.

5. Describe some varied exercises in mental arithmetic suitable for children in an infant class.

6. What lessons in Number can be given to a first class in an infant school (*not Standard I.*)?

7. Supposing the infants to have thoroughly learned the meaning, composition, and notation of the numbers from *One* to *Nine*, describe in detail, with examples and illustrations, the course you would adopt for giving them a similar knowledge of the numbers *Ten*, *Eleven*, and *Twelve*.

8. Say what sort of pictorial or other visible illustrations you would use in teaching the elements of arithmetic to very young children, and show what use you would make of such illustrations.

9. Show in how many ways you could vary exercises in mental arithmetic suited for the upper class of an infant school.

10. Describe the best system you know for teaching numeration and notation.

11. Give eight examples of useful mental exercises for young children, the highest number not to exceed 30.

12. Give some hints for making oral exercises in arithmetic interesting.

CHAPTER XIII.—JUNIOR ARITHMETIC.

1. **Scope of the Work.**—Under the head of "Junior Arithmetic" we place the work required of children from seven to ten years of age, embracing the four simple rules and the compound rules applied to Money, Weights, and Measures.

Here we find the practical arithmetic of everyday life—the arithmetic of the shop and the house, with which all need to be thoroughly acquainted. Moreover, all higher arithmetic work is based on a knowledge of the four simple and compound rules; the work of this stage, therefore, should receive very careful and thorough teaching.

2. The Code now provides two schemes of work—Scheme A and Scheme B, which differ chiefly in the *lower* divisions.

The principle underlying the new Scheme B is thus stated in the *Instructions to H.M.I.*:—

"Many experienced teachers believe that the true progression in arithmetic is not to be found in advancing from addition

and subtraction to multiplication and division with the large numbers often given in sums, but in graduated exercises beginning with small numbers and exhausting all their combinations.

"Such teachers will take, for example, the number 20, and after helping the scholars to count cubes or other objects, will dissect the number, find out in how many ways it is made up, learn its fractions and aliquot parts, apply it to money, length, hours, and minutes, and perform all the arithmetical processes, both orally and in writing, which can be dealt with within that limit, higher numbers being reserved to a later stage.

"My Lords desire that teachers who adopt this view of arithmetical teaching should be at full liberty to give effect to it; and the alternative scheme (B) will be found to have been framed for this purpose."

This scheme, by confining the children's attention for a longer period to *small* numbers, permits every principle to be thoroughly illustrated, and *rules* to be formed as the result of *direct observation*. • *Principles* are placed before mechanical accuracy, and quickness and dexterity in dealing with small numbers are encouraged.

The course of teaching is, in fact, the direct *continuation* of the scheme of work we have suggested as suitable for the infant school. •

3. Importance of Strict Discipline.—The science of arithmetic is a strictly progressive one; each new step depends on a grasp of the preceding ones; that the teacher, therefore, should *know* the child's difficulties and remove them, is essential to progress.

Where "copying" is rife in a class this cannot be the case; the teacher is misled in regard to the children's capabilities, and proceeds to new ground when he ought to tarry longer on the old. The children's difficulties are thereby increased; their grasp of the subject becomes less and less with each new advance; and in sheer desperation copying spreads. When a rigorous test is applied the class fails utterly, and the young teacher wonders how such results could have been occasioned.

"Copying" destroys the child's interest in his work; therefore the stimulus to exertion and independent effort is removed.

Copying to any extent shows a want of "tone" in the class. The practice should be regarded as a grave moral offence, and treated accordingly.

But the teacher should carefully consider whether he himself is not to blame by reason of—

- (a) *Lax supervision.*—Children are naturally anxious to know if their sums are correct. Where the teacher is not a disciplinarian, they start by *comparing their answers* with the next child's; and thus the first step to "copying" is taken.
- (b) *Want of clearness in teaching.*—Where a child has not understood the teaching, and yet is expected to produce correct answers, the temptation to copy must be very strong.
- (c) *Lack of special attention to backward scholars.*—It is among such scholars that the practice is most frequent. In the early stages of a new rule the teacher should have these scholars near at hand, and give them constant supervision and individual help.
- (d) *Misjudging children's capabilities.*—To the teacher the work is so easy that he fails to see the difficulties it presents to the young child; hence, though the teaching may be clear, the points are hurried over before the children have obtained a mastery of them.
- (e) *Undue severity.*—The teacher who punishes a child for not working a sum correctly, is responsible for the child's copying. We hope there are but few such instances; yet it is well to mention it, in case young teachers in their enthusiasm for "results" should fall into the error. Systematic gross carelessness in work with which the child has for a long time been familiar, is a different thing from what we are now considering.

We have pointed out with some fulness the causes of copying, because the subject is an important one; and knowing the causes, the teacher will be able to apply the appropriate remedy.

The best way to avoid copying is to **remove the cause**, and to make the practice difficult. The practice will not exist where the children look on the teacher as a friend and helper. Encourage them to *ask for help* when, after honest effort, they have failed to solve a difficulty. This practice is most helpful both to teacher and children; for it shows the teacher the child's difficulty, and indicates to him where his teaching has not, perhaps, been sufficiently full and clear; and at the same time a stumbling-block is removed from the child's path.

If many want help, it shows *the teaching is at fault*. The teacher should then ascertain all the points of difficulty, and, from the black-board, *again* give the lesson, devoting special attention to the elucidation of these points.

Do not be severe even in your speech or manner; children should never work in fear of displeasure. There is no more powerful incentive to copy than this. Make copying difficult by giving different work to neighbouring children.

4. The Teacher's Preparation.—Arithmetic is not to be taught by rule of thumb as the application of so many formulæ which the children know how to apply but do not understand. The child is not only to know *what to do*, but *why it does it*. The subject requires sustained reasoning and clearness and exactness of statement. Step by step, the teacher has to lead up to and establish the truth to be taught. Too often we *think* we understand a thing thoroughly; but when we come to *explain* it to little children we find there are many links wanting in the chain, many weak spots which need strengthening.

The teacher must consider in what stages the result may best be attained, and prepare teaching and testing examples appropriate to each stage.

In **teaching** a rule it is most essential the teacher should know the difficulties which will occur in any sum set to test the children's progress; otherwise it often happens that a point arises during the working which has not been provided for by the teacher.

One difficulty should be presented and taught at a time, and the teacher should be certain that every sum set contains this difficulty and no other in advance of the teaching; hence the necessity of preparing what we call **teaching examples**. Books of exercises are, as a general rule, not sufficiently graded for working during the initial stages.

The teacher should note all points which he has found to cause difficulty in the teaching of the rule, and in his **revision exercises** he should take care that all such points are included.

The industrious, earnest teacher will find, in these and other points, plenty of scope for preparation which will have a marked effect on the success of his teaching. Such labour is in the long run time *saved*, both to teacher and children. When

prepared, these examples should be carefully preserved for future use.

5. Apparatus.—Chalk, duster, black-board, and ball-frame are not sufficient. The subject presents scope for ingenuity in devising tangible means of illustrating the principles of notation and of the four simple rules, the construction of the tables of weights and measures by experiment, &c.

The earnest teacher will possess the means of clearing up any difficulty which may arise. Readiness of resource is characteristic of the skilful teacher. Such a teacher will have ready to hand, in a form convenient for use, "the dimensions of the schoolroom, the playground, and the desks, and the weight of a few familiar objects" (*Instructions to H.M.I.*).

6. Slate versus Paper Work.—Arithmetic affords a valuable disciplinary training in neatness, accuracy, and logical statement. The child must be early taught that slovenly and inaccurate work is a bar to real progress, and that **thought** must **precede**, not follow, statement. Too often the child works in a blind, mechanical way, and takes the trouble to *think* only when the sum is seen to be incorrect.

Paper work is a valuable aid, since no alteration is possible without being observed. Much slate practice leads to carelessness and untidy work; hence paper work should be given as early as possible. There is no reason why it should not be commenced in the lowest division. Alterations should always involve a loss of marks.

7. Correction of Exercises.—The way in which the teacher marks the sum is frequently a weak point in arithmetical teaching. This is the teacher's opportunity for discovering individual children's *special* difficulties; yet too frequently the teacher does not take advantage of it.

Young teachers especially are often content to **mark the answer alone** as correct or incorrect, without, in the latter case, finding out **where** and **why** the sum is incorrect; consequently the **same error** is repeated again and again, and the error is intensified and the child disheartened.

The careful teacher, on the other hand, probes for the **source** of the error, with the view to see whether it arises from carelessness or lack of knowledge. In the latter case the matter is carefully explained to the child, and the error is entered in the teacher's note-book as a point to be introduced into the revision exercises.

When a rule is being learnt much time is frequently wasted by deferring correction till the sum is finished. In teaching exercises it is better to make the correction at each stage of the working.

No sum should be marked as correct unless the steps are arranged in logical order, and in such a way as will facilitate the teacher following the chain of reasoning. Verbal explanations should accompany the figures, to show that the child really understands what it has done.

Assign a numerical mark to each sum, taking care that logical statement and neatness of work are credited with a large proportion of the marks; for where these are found, accuracy will be sure to follow.

The teacher will do well to remember that bad figures and slovenly arrangement are prolific sources of inaccuracy.

8. Mental Arithmetic.—In the past, the value of this subject as an effective mode of teaching the principles of the science has not been sufficiently recognized.

“The object of this exercise is to encourage dexterity, quickness, and accuracy in dealing with figures, and to anticipate, by means of rapid and varied oral practice with small numbers, the longer problems which have afterwards to be worked out in writing. It is obvious that this general object cannot be attained if the exercises are confined to a few rules for computing ‘dozens’ and ‘scores’, such as are often supposed to be specially suited for mental calculation.”

“Oral practice should be given in all the ordinary processes of arithmetic, and should be so varied as to furnish as many different forms of exercise as possible in concrete as well as abstract numbers, and in the fractional parts of money, weights, and measures. In the last quarter of the school year it should deal chiefly with the work of the next highest standard.” (*Instructions to H.M.I.*)

The mental problem has the same disciplinary value as the written one, and has, further, the advantage of being quickly worked. The written problem, however, is also a test of accuracy of work.

9. Problems.—“A problem is a question requiring the application of more than one rule, and demanding some thought in discovering the rules to be applied” (*Instructions to H.M.I.*).

Ability to solve problems is regarded as the test of successful

arithmetical teaching. "It will be right to report that this subject (*arithmetic*) has been *well* taught if 51 per cent at least of the scholars examined work the problem (*i.e.* not necessarily give a correct solution, but make an intelligent attempt at its solution), and answer correctly three questions out of the four, or give correct answers to three questions, one of which must be the problem" (*Instructions to H.M.I.*).

Ability to solve the problem, and to show in detail the method of solving, proves that the child has grasped the given conditions, seen how these are related to each other, and recognized the rules to be applied in order to effect the solution.

The *teaching* of any rule should be through sums stated in a **concrete** form; this leads to intelligent work, a sure stepping-stone to success in problematic work.

Too often children are dismayed by the sight of a sum in problematic form, however easy it may be. The teacher should remove this feeling by substituting numbers easily dealt with *mentally*, whilst preserving *the same form of statement*.

Encourage your children before attempting to solve a problem, always to substitute for the hard numbers given, easy ones which they can work mentally; they thus have a ready test whether the method they propose to adopt is the correct one or not.

The results of intermediate stages in the solution should be arranged on the black-board by the teacher so as to show the *rules involved* in the solution; thus—

"A man has 7 bags of oranges with 20 in each bag. To how many boys can he give 4 oranges each?"

$$\begin{array}{rcl}
 & 20 \text{ oranges.} & \\
 & 7 \text{ bags.} & \\
 \text{Number of oranges} & \left. \vphantom{\begin{array}{l} 20 \\ 7 \end{array}} \right\} = 4 \times 140 = & \left\{ \begin{array}{l} \text{whole number oranges} \\ \text{to be divided.} \end{array} \right. \\
 \text{each had} & & \\
 \text{Ans. } \underline{\underline{35}} & = & \text{number of boys.}
 \end{array}$$

The problems should be **attacked in types**, so that children may acquire confidence. The type should be presented in as many aspects as possible, in order that children may recognize that, under varying forms, the *same relations* may exist between numbers.

To delay the teaching of problems till all the rules are mastered, is a mistake: problems should follow the concrete

teaching of each rule and grow naturally out of it; for it is but the combination of this rule with some preceding one, and, therefore, will be better attacked whilst the rule is fresh in the child's mind.

Problems arouse the interest of children and stimulate independent thought and effort. Adhering to a long succession of mechanical sums has a deadening effect on the mental powers; it leads children to expect always to find the rule stated in the same form, consequently they fail to recognize it under any other.

Problematic work does away with this mechanical stereotyped form of working, and provides a means of revising back rules in a way which will maintain the children's interest in them.

The problem deals with the practical affairs of life, and brings home to the children the value of arithmetical work.

The earnest teacher will utilize the problem for conveying much valuable information which, presented in this guise, will be the more readily remembered.

10. Hints on Teaching a New Rule.—The following hints may prove of service to young teachers:—

(1) Present the sum in a **concrete form**, and, where possible, especially in the early rules, work out with tangible objects.

(2) Always teach the principle of the rule through **easy mental** examples, worked out on the black-board in such a way that the method of working is clearly seen.

(3) From an examination of the mode of working a number of mental examples **formulate the rule**.

(4) Where possible, **attack the rule in stages** or steps, making one stage secure before proceeding to the next.

(5) **Prepare teaching and test exercises** for use at each stage of progress.

(6) Let the sums set be of a **practical character** and not involve too much mechanical work.

(7) **Vary the mode of statement** as much as possible.

Illustrations of these points will appear when we are considering the teaching of the different rules.

11. Numeration and Notation.—Future success will be largely influenced by the teaching of this subject. None of the four simple rules can be *intelligently* taught unless the principle of the decimal system of notation is grasped. For this purpose illustrations are essential. The teacher will do

well to continue the use of the same apparatus to which the child has been accustomed in the infant school.

The whole battle is to be fought in the notation of 1st to 1000 other stages are but a repetition of this *with a new unit*, namely the one *thousand* or the one *million*; therefore, the means of illustrating notation to one thousand should be ready to the teacher's hand.

The apparatus used may be the Vivid Arithmetic Box, the Ball-frame, or sticks tied in bundles. „

The subject should be taught in the following stages, taking up the work where we left it in the infant school:—

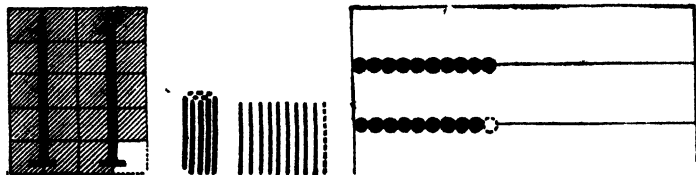
- (a) 19 to 99.
- (b) 99 to 999.
- (c) 999 to 999,999.
- (d) Higher numbers.

12. OUTLINES OF A LESSON ON THE NOTATION OF 19 TO 99.

Apparatus.—Vivid Arithmetic Box, Sticks, or Ball-frame.

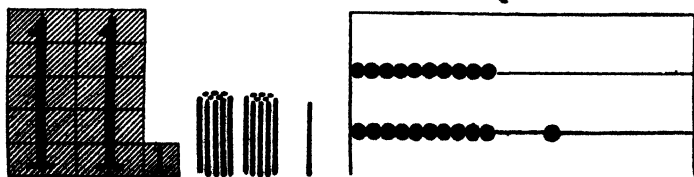
First Step. Numeration 20 to 29:

(a) Represent 19 in the form already learnt, and count on to 20.



The one added is seen to complete another 10; so that 20 is made up of 2 tens.

(b) By counting, show separately each of the numbers from 20 to 29 arranged in the form given below.



Second Step. Notation of 20 to 29:

(a) The children examine the concrete representation of each number, and say of what each is composed, first in this form—

2 tens	make 20.
2 tens and 1 one	„ 21.
2 tens and 2 ones	„ 22. ▲
2 tens and 9 ones	„ 29.

Then in the following form—

20	equals 2 tens.
21	„ 2 tens and 1 one.
22	„ 2 tens and 2 ones.
	&c.

(b) Show how the numbers are expressed. The black-board and slates should be ruled thus—

Tens. Ones.

2		1
2		2
2		3
.....		
2		9
2		0

The teacher points to the representation of 21, and the children state *collectively* of what the number is composed, viz. 2 tens and 1 one. As each part of the answer is given, the children and teacher place the figure representing it in the proper column.

20 is seen to be composed of 2 tens only. The use of the cypher (a) to show the absence of units or ones; (b) to give the tens figure its proper “local value” is explained, and compared with the notation for 10.

Third Step. Exercises:

(a) The children *represent* in the concrete any number named by the teacher.

(b) The children *write* the symbol for any number represented by the teacher in the concrete.

(c) The children write any number *dictated*.

(d) The children *name the components* of any number mentioned.

Fourth Step. Remaining Numbers to 99:

The same method of teaching is pursued, first with numbers

between 29 and 39, then between 39 and 49, and so on to 99.

Each of the other stages will be treated in the same way.

13. Additional Hints on Notation—

(a) **The cypher** causes trouble in the *tens* place. Represent the number, and accustom the children to state its components thus:— $409 = 4$ hundreds, 0 tens, and 9 ones.

(b) **Thousands**.—Show the *new unit*—the *one* thousand. Treat the notation of this new unit in every respect as in the former case. Do not combine hundreds with the thousands until the latter can be *well* written.

(c) **Millions**.—Treat these in a similar way to the thousands.

(d) **Mechanical Aids**.—At first some mechanical aid is helpful. The following, in whole or part, may be used with advantage at different stages of the teaching—

Millions.	Thousands.	Units.
H. T. O	H. T. O	H. T. O.

(e) **Decomposition of Numbers**.—Give plenty of practice in stating the value of a number in terms of different units, *e.g.*—

$$\begin{array}{rcl}
 537 & = & 5 \text{ hundreds} + 3 \text{ tens} + 7 \text{ ones.} \\
 = & & 53 \text{ tens} + 7 \text{ ones.} \\
 = & & 537 \text{ ones.}
 \end{array}$$

(f) **Numeration**.—Frequently require the answer of a sum to be written in *words*.

14. Simple Addition.—This is frequently a badly-taught rule, and is worked by mechanical methods of counting, because no *system* of adding is taught. The children are often left to obtain their results in any manner they choose, or, as it is sometimes expressed—“in their heads”.

The method of adding adopted in the infant school must be continued and extended, *viz.* either by means of the table, with the extension already pointed out (p. 193), or by means of the components of numbers *working through the nearest ten*.

The rapid addition of the *same number* is a good preparation; for it fixes all the components of the given number, *e.g.*—

7	70	In these 9 additions we get every possible combination of the components of 7. When the child can perform this addition with accuracy and rapidity, he will be able to add 7 wherever it may occur in the addition sum. The figures should be written on the black-board in a <i>vertical</i> column. There are two stages of progress in this exercise— (1) When the child states <i>each step fully</i> , <i>e.g.</i> :
7{ $\frac{3}{4}$	63	
7{ $\frac{6}{1}$	56	
7	49	
7{ $\frac{2}{5}$	42	
7{ $\frac{5}{2}$	35	
7	28	
7{ $\frac{1}{6}$	21	
7{ $\frac{4}{3}$	14	
7		

$$7 + 3 = 10; 10 + 4 = 14; 14 + 6 = 20; 20 + 1 = 21.$$

- (2) When the intermediate steps are omitted, and the child gives only the final result of the addition, *e.g.*:

$$7 \qquad \qquad \qquad 14 \qquad \qquad \qquad 21.$$

Afterwards commence the addition with 17, then 27; and so on. As the addition of each number is mastered, special sums should be constructed introducing only this and preceding numbers. Get a column of *units* well and quickly added before introducing tens and hundreds; for this is the most difficult stage.

15. The Working of an Addition Sum.—This should be taught in stages—

- (1) Addition of tens and units *without* “carrying”.
- (2) Addition of tens and units *with* “carrying” from the units.
- (3) Addition of tens and units *with* “carrying” from the tens and units.
- (4) Addition of hundreds, tens, and units.

Hints for Working—

- (1) Dictate sums in a concrete form. Use things in which the children are interested, *e.g.* marbles, apples, &c.
- (2) Give concrete representations of the numbers.
- (3) Show the change from one denomination to the other in the concrete.
- (4) Test the accuracy of the work by both ascending and descending additions.

(5) Accustom the children to the use of the terms **sum, amount, total, plus (+)**.

Arrangement of the Working—

(a) 15 units or ones are represented in the concrete and changed into 1 ten + 5 ones. Place the 1 ten *beneath* the tens column.

(b) 15 tens are similarly changed into 1 hundred and 5 tens; and the 1 hundred is placed *beneath* the hundreds column.

			6
H.	T.	O.	
	4	3	
4	2	5	
	3	4	
1	5	3	
8	5	5	= Sum.
1	1		

16. Mental Addition of Tens.—There are three stages of difficulty—

(1) When the sum of the units figures does *not* make another complete ten, *e.g.* 25 + 33.

Method—2 tens 5 + 3 tens = 5 tens 5; 5 tens 5 + 3 = 5 tens 8 = 58.

(2) When the sum of the units figures *just* make another complete ten, *e.g.* 25 + 35.

Method—2 tens 5 + 3 tens = 5 tens 5; 5 tens 5 + 5 = 6 tens = 60.

(3) When the sum of the units figures *exceeds* another complete ten, *e.g.* 25 + 37.

Method—2 tens 5 + 3 tens = 5 tens 5; 5 tens 5 + 7 = 6 tens 2 = 62.

Plenty of black-board work or practice from the “Vivid Mental Calculator” is necessary in order to attain speed and dexterity in this exercise.

17. Simple Subtraction.—By practical mental questions accustom the children to the *various forms of statement* now given, and impress upon them that what is wanted is to find the *difference* between two quantities, and that this is done by taking the smaller from the larger quantity.

(a) *How much longer* is one desk than the other? Let the children find the actual measurements.

(b) What is the *difference* in the length of the two desks?

(c) How many feet must be *added* to the length of the second desk to make it equal to the length of the first?

(d) How many feet is the second desk *less than* the first?

(e) *From* the length of the first desk *take* the length of the second desk.

(f) How many feet will *remain* if I cut off the length of the second desk from the length of the first?

Practice in telling the greater of two numbers will be needed unless the teacher has taught notation pictorially.

Three Methods of Working.—There are three methods employed—

(1) **The Decomposition Method.**—This depends on the principle that we take one number from another when we take separately the parts of the smaller number from the corresponding parts of the larger one.

(2) **The Method of Equal Additions.**—The principle upon which this method is based, is that the remainder is not altered if the *same number* be added to both the subtrahend and minuend.

(3) **The Method of Complementary Addition.**—This depends on the fact that the subtrahend and the remainder are together equal to the minuend.

$$\begin{array}{rcl} 2763 & = & \text{minuend.} \\ 1894 & = & \text{subtrahend.} \\ \hline 869 & = & \text{remainder.} \end{array}$$

The terms used will be understood from the above example. The third method is at present little used in schools.

The principle of decomposition has been taught in the mental work of the infant school; its extension to higher numbers should therefore cause little difficulty.

Stages of Progress.—To make the *reasons* for the working intelligible to children is not easy: the rule should, therefore, be approached gradually in the following stages:—

- (1) Subtraction *without* changing the numbers (“borrowing”).
- (2) Subtraction *with* changing the numbers (“borrowing”) in the units.
- (3) Subtraction *with* changing the numbers (“borrowing”) in the tens.
- (4) Subtraction *with* changing the numbers (“borrowing”) in the units and tens.

18.

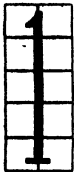





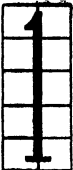

OUTLINES OF A LESSON ON

SUBTRACTION, *e.g.* 43 - 28.

A. BY THE DECOMPOSITION METHOD.

Apparatus.—To show the way to use different apparatus we will select Number-pictures for this lesson, and sticks for the following lesson; though either may be used with both lessons.

First Step. The sum stated.—Represent each of the numbers in the concrete, and examine them to see which is the larger number. Place this above the other in the way shown.

				Tens.	Ones.
					
				4	3
				2	8

Second Step. The principle of Decomposition.—Revise the work of the infant school, working the following mental exercises:

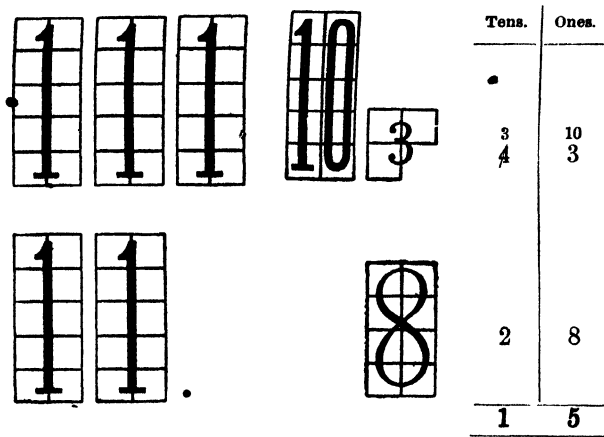
- (a) $13 - 2$. *Working*— $3 - 2 = 1$. 1 ten + 1 = 11.
 (b) $13 - 8$. *Working*—8 ones could *not* be taken from 3 ones; we, therefore, *changed* the 1 ten into 10 *separate* ones. Having done this we took the 8 ones from the 10 ones, which left 2 ones; and to these we added the 3 ones we already had; thus obtaining 5 ones.

Work this out with the tablets, and give plenty of other examples where change of the 1 ten into 10 ones is necessary.

Third Step. The principle applied:

- (a) Proceed to subtract 8 ones from 3 ones. This is seen to

be impossible. What shall we do? The children suggest changing 1 ten into 10 ones, which we at once proceed to do, showing that process thus—



(b) The 8 ones are now taken from the 10 ones, leaving 2 ones, to which the 3 ones are added, making 5 ones, the first part of the answer.

(c) The 2 tens are now taken from the 3 tens, leaving 1 ten, the remaining part of the answer.

Fourth Step. The Rule stated.—Examine the steps of the working and state concisely what has been done.

(1) Place the *larger* number *above* and the smaller number *beneath*.

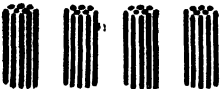



(2) Take separately ones from ones and tens from tens.

(3) If there are not sufficient ones, change one of the tens into 10 ones.

(4) Subtract the ones from the 10, and add to the remainder the former ones.

Fifth Step. Exercises.—With the worked example and the written statement before the children, give similar exercises to be worked on the black-board and on slates by individual children.

B. BY THE METHOD OF EQUAL ADDITIONS.*Apparatus.*—Sticks tied in bundles.*First Step. The sum stated.*—Proceed as in Step I. of the preceding lesson.

				Tens.	Ones.
				4	3
				2	8

Second Step. The principle of Equal Additions:

(a) Give mental examples such as the following. State the work on the black-board.

(a)	(b)	(c)	(d)
5	7	9	15
<u>2</u>	<u>4</u>	<u>6</u>	<u>12</u>
3	3	3	3

(b) Examine (b), (c), and (d), and show that the same number has been added to the minuend and subtrahend of (a).

5	•	7 = 5 + 2	9 = 5 + 4	15 = 5 + 10
<u>2</u>		4 = 2 + 2	<u>6</u> = 2 + 4	<u>12</u> = 2 + 10
3		3	3	3

(c) State what has been found out—






- (1) Equal numbers have been added both to top and bottom lines.
- (2) The remainder is not changed.

Third Step. The principle applied:

(a) Proceed to take 8 ones from 3 ones. This is seen to be impossible.

(b) Lead the children to suggest that the same number may be added both to the top and bottom lines *without the value being altered*. Show that 10 is the most suitable number, because the "place value" of a number increases by 10; hence

demonstrate that 10 ones are equal to 1 ten. We therefore add 10 ones to the top line and 1 ten to the bottom line. Represent this in the way now shown—

				Tens.	Ones.
			.	4	¹⁰ 3
				¹ 2	8
				<u>1</u>	<u>5</u>

(c) The 8 ones are now taken from the 10 ones, leaving 2 ones; to which the three ones are added, making 5 ones, the first part of the answer.

(d) The 3 tens are now taken from the 4 tens, leaving 1 ten, the remaining part of the answer.

Fourth Step. The Rule stated.—Examine the steps of the working, and state concisely what has been done.

(1) Place the *larger* number *above* and the smaller number beneath.

(2) Take separately ones from ones and tens from tens.

(3) If there are not sufficient ones, add 10 ones to the top line and 1 ten to the bottom line.

(4) Subtract the ones from the 10, and add to the remainder the former ones.

Fifth Step. Exercises.—These are similar to the preceding lesson.

19. "Borrowing".—The practice of "borrowing 10 and paying back 1" dies hard, but no teacher who wishes the children to derive the full advantage from the arithmetic lesson will adopt such a device; it certainly would not be considered an intelligent method by H.M. Inspector.

A free use of illustrations in the concrete, a thorough grasp of *one* stage before proceeding to the next, and a plentiful supply of examples adapted to each stage, will remove any difficulties which the subject may present.

Make good use of your black-board when correcting errors, and let this teaching be accompanied by illustrations worked in the concrete.

20. Difficulty with Cyphers.—In the Decomposition Method teachers and children sometimes experience difficulty in dealing with the cyphers; but, when properly taught, no difficulty should arise; all depends on the teacher's method.

Before attempting sums such as the following, the skilful teacher will spend a couple of lessons in the decomposition of Number until he has illustrated and *fixed* in the children's minds that—

$$\begin{aligned} 100 &= 9 \text{ tens, and } 10 \text{ ones.} \\ 1000 &= 9 \text{ hundreds, } 9 \text{ tens, and } 10 \text{ ones.} \end{aligned}$$

This result should be led up to, step by step, by concrete work with tablets, sticks, &c., in the following form:—

The *final* result is committed to memory.

The change is indicated in the sum in the way shown.

$$\begin{array}{r|l|l|l} 1000 = & \overset{o.}{1} & \begin{array}{l} H. \\ 10 \\ 9 \\ 9 \end{array} & \begin{array}{l} T. \\ \\ 10 \\ 9 \end{array} & \begin{array}{l} O. \\ \\ \\ 10 \end{array} \end{array}$$

$$\begin{array}{r} 9910 \\ 1007 \\ 534 \\ \hline \hline \end{array}$$

21. The Concrete Form of Sum and Problems.—“In the First and Second Standards two at least of the sums orally proposed should be set in concrete quantities, and both the numbers employed and the articles spoken of should be such as are within the range of the ordinary experience of scholars of seven or eight years of age” (*Instructions to H.M.I.*).

We would urge that *all* work be given in a concrete form, as this makes work more intelligent, interesting, and useful.

Problems enable the teacher to revise the work in addition. Those set should include the following forms:—

- (1) $(x + y + z) - r.$
- (2) $r - (x + y + z).$
- (3) $(x + y - z) - (a + b + c).$

Problems involving two or more applications of the rule of subtraction prove a difficulty to children, *e.g.*—

“A and B have x of which B owns y . A gives away z . Find the difference between A and B's share.”

22. Mental Subtraction.—The importance of quick,

accurate mental work is self-evident. The work should be attacked in the following stages:—

- (1) $17 - 3$. *Working*— $7 - 3 = 4$; $10 + 4 = 14$.
- (2) $37 - 3$. *Working*— $7 - 3 = 4$; $30 + 4 = 34$.
- (3) $14 - 8$. *Working*— $10 - 8 = 2$; $2 + 4 = 6$.
- (4) $34 - 8$. *Working*— $10 - 8 = 2$; $24 + 2 = 26$.
- (5) $45 - 13$. *Working*— $45 - 10 = 35$; $35 - 3 = 32$.
- (6) $45 - 18$. *Working*— $45 - 10 = 35$; $35 - 8 = 27$.

23. The Multiplication and Division Tables.—

Success in future rules depends on the intelligent grasp the children have of the *structure* of the tables, and the degree of quickness and accuracy with which they are answered. Learning the tables by mechanical straightforward *repetition* only is of little use.

In learning the tables the following points should be borne in mind:—

(1) The table must be **built by the child**, so that he may see *how* the results are obtained.

(2) *In the process of building* its **use** both for multiplication and division must be demonstrated by solving little concrete sums by its aid.

(3) *Small portions* only should be built and committed to memory at one time.

(4) The association of like sounds and the recurrence of a particular figure cause some products to be remembered more readily than others, *e.g.* $5 \times 5 = 25$; $6 \times 6 = 36$; $7 \times 11 = 22$.

(5) Because of the lack of associated sounds and from other causes some numbers present special difficulties, *e.g.*—

$3 \times 3 = 9$.	$4 \times 7 = 28$.	$5 \times 6 = 30$.
$3 \times 7 = 21$.	$4 \times 8 = 32$.	$6 \times 5 = 30$.
$3 \times 8 = 24$.	$4 \times 9 = 36$.	$6 \times 9 = 54$.

$7 \times 8 = 56$.	$9 \times 3 = 27$.
$7 \times 9 = 63$.	$9 \times 7 = 63$.
$8 \times 7 = 56$.	$12 \times 7 = 84$.
$8 \times 9 = 72$.	$12 \times 9 = 108$.

Write these out boldly on separate cards, and place them in front of the child for **daily** repetition.

(6) Show the product of two numbers is the same whichever

is made the multiplier, *e.g.* $3 \times 9 = 27$; $9 \times 3 = 27$. Use the ball-frame or other visible means to accomplish this.

$$\left. \begin{array}{l} 9 \\ 9 \\ 9 \end{array} \right\} 3 \times 9 = 27.$$

3 3 3 3 3 3 3 3 3

$$9 \times 3 = 27.$$

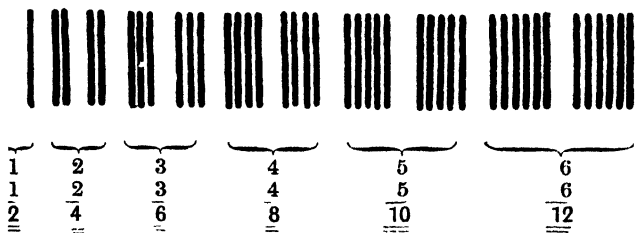
(7.) Since the products of the cypher (0) are often mistaken, start each table with the cypher.

24.

OUTLINE OF A LESSON, ON

TABLE BUILDING, to Twice 6=12.

First Step. The Concrete Representation.—On the ball-frame, or by using sticks, buttons, &c., the children represent the table as shown.



As each group is laid, the children say "1 stick and 1 stick more make 2 sticks", and so on.

Second Step. The Table as a Series of Additions:

(a) The children point to the parts of each group of sticks and represent the value in *figures* on the slates in the form shown above.

(b) The whole number of sticks in each group is counted and the sum placed in the answer, as in the above.

(c) The teacher points to the blank space in front of the first group, and so obtains that "0 sticks and 0 sticks are 0 sticks". The cyphers are then placed in position, thus—

$$\begin{array}{r} 0 \quad 1 \\ 0 \quad 1 \quad \&c. \\ \hline 0 \quad 2 \end{array}$$

Third Step. Exercises on the Additions:

The children are shown the use of the results thus obtained, by questions such as the following:—

(a) A girl gave me 5 sweets and then 5 sweets more. How many sweets had I?

(b) Two boys had 5 marbles each. How many marbles had they together?

(c) On a plate are 10 apples. Some children come and take 5 apples each. How many children came?

(d) In a field are 10 cows. A man went twice and brought them all away, bringing the same number each time. How many cows did he bring at one time?

Fourth Step. The Table learnt:

The children point to the group of sticks and repeat—

Multiplication.—(a) Two 1 are 2;

Two 2 „ 4, &c.

(b) Then—Twice 1 are 2;

Twice 2 „ 4, &c.

Division.—

(c) In 2 there are two 1;

„ 4 „ „ „ 2;

„ 6 „ „ „ 3, &c.

Fifth Step. The Table written:

The usual form of writing the table is approached in the following steps:—

$$\begin{array}{r} (a) \quad \begin{array}{cccc} 0 & 1 & 2 & 3 \\ 0 & 1 & 2 & 3 \\ 0 & 2 & 4 & 6 \end{array} \quad \&c. \\ \hline \end{array}$$

(b) $2 \times 0 = 0$; $2 \times 1 = 2$; $2 \times 2 = 4$; $2 \times 3 = 6$, &c.

(c) $2 \times 0 = 0$

$2 \times 1 = 2$

$2 \times 2 = 4$, &c.

25. Simple Multiplication.—From the method by which we have taught the tables, the children will recognize that multiplication is a short form of adding the same number

several times. Work on the black-board a few illustrative examples to show this. Put these in a concrete form—

T.	O.		T.	O.
	8			8 = the number added.
	8			4 = the number of times 8 is added.
	8			
	8			
3	2 = sum.	3	2 = product.	

This rule, if it is to be worked intelligently, must be approached in well-defined stages, each of which must be made secure before proceeding to the next stage.

Stage I. Multiplication by One Figure.—The principle to be demonstrated is that each figure can be multiplied *separately*.

Take an example such as 17×4 . Represent 17 in the concrete as 1 ten and 7 ones. Repeat this 4 times. What we want to find is the sum of 4 sevens and the sum of 4 tens.

Work the sum by addition; and then show that the principle of taking each denomination *separately* also applies to multiplication, which is only a shortened form of addition.

T.	O.	T.	O.
1	7	1	7
1	7	1	7
1	7	1	7
1	7	1	7
6	8	6	8
2		2	

Stage II. Multiplication by 10.—Treat as a special case of the preceding stage, using 10-times table. Compare the digits of the answer with those of the multiplicand, and note that each is moved **one place to the left**.

Stage III. Multiplication by Factors.—Two classes of exercises should be given—

- (1) Numbers which contain multiples of 10, *e.g.* $2 \times 10 = 20$;
- (2) Numbers made up of other factors, *e.g.* $8 \times 4 = 32$.

(A specimen lesson is given below.)

Stage IV. Multiplication by Numbers which are not Exact Multiples.—Take an example, *e.g.* 548×46 .

What we want to find is the sum of 46 five hundred and forty-eights. But $46 = 40 + 6$. Therefore we want to find the sum of 40 five hundred and forty-eights and 6 " " " " and add these two sums together.

The first of these two operations is taught in Stage III. and the second in Stage I.

Stage V. Multiplication by 100 and its Multiples.—Treat 100 as a special case of Stage III., multiplying by the factors 10×10 . Examine the digits of the final product, and note that they are the same as those of the multiplicand, but **moved two places to the left**.

The multiples of 100 are taught in the same way as the multiples of 10.

Stage VI. Multiplication by any number of 3 figures, *e.g.* 384×456 .—We teach this by showing that what is wanted is the sum of

$$\left. \begin{array}{l} 384 \times 400 \text{ (the work of Stage V.)} \\ 384 \times 50 \text{ (" " III.)} \\ 384 \times 6 \text{ (" " I.)} \end{array} \right\} = 384 \times 456.$$

$$\underline{\underline{384 \times 456}}$$

26.

OUTLINE OF A LESSON ON

MULTIPLICATION BY A MULTIPLE OF 10.

Example: 634×20 .

Knowledge assumed.—Ability to multiply by numbers to 12.

First Step. The Sum examined.—State the sum in a **concrete** form, *e.g.* "20 boys each have 634 marbles. How many marbles have they together?"

We want to take each boy's marbles, put them into one heap, and find out how many there are in the heap.

Second Step. Mental Exercises.—Give a number of easy mental exercises, *e.g.*—

(a) 5 boys had 4 marbles each. How many had they together? *Ans.* 20.

(b) 5 other boys had 4 marbles each. How many had they together? *Ans.* 20.

(c) 10 boys had 4 marbles each. How many had they together? *Ans.* 40.

How might this result have been obtained from (a) and (b)?

(1) By adding 5 boys' marbles to the other 5 boys' marbles, $20 + 20 = 40$.

or (2) Since there are **2 groups** of boys each group with the same number of marbles, multiply the number of marbles one group had by the number of groups $= 20 \times 2 = 40$.

that the same *final* result would be obtained by multiplying at once the *top* line by 2, taking care to move each figure of the quotient one place to the left.

Show this shortened form side by side with the other.

$$\begin{array}{r}
 \text{T O. H. T. O} \\
 6 \ 3 \ 4 = \text{marbles 1 boy had.} \\
 \underline{2 \ 0} \\
 1 \ 2 \ 6 \ 8 \ 0 = \text{marbles 20 boys had.}
 \end{array}$$

Fourth Step. The Rule stated.—From an examination of the steps in the working deduce the rule—

“To multiply by 2 tens (20) we multiply by 2, and move each figure of the product one place to the left by placing a cypher in the units place”.

Fifth Step. Exercises.—Set suitable tests to be worked step by step with the teacher, explaining each step of the process.

Note.—The form adopted is preferable to placing the cypher *beyond* the units figure to the right, as this is the form required when multiplying by such a number as 56. Uniformity of method is desirable.

$$\begin{array}{r}
 634 \\
 \underline{20} \\
 12680
 \end{array}$$

This lesson suggests the plan of teaching to be pursued in multiplying by the factors of any number.

27. Division.—The principle of Division has been illustrated in our treatment of the tables.

We see—

- $$\begin{array}{l}
 (1) \text{ That if 28 apples are divided into } 7 \left. \begin{array}{l} 7 \\ 7 \\ 7 \end{array} \right\} 4 \times 7 = 28. \\
 \quad \quad \quad 4 \text{ groups, each group will contain } \\
 \quad \quad \quad 7 \text{ apples.} \\
 (2) \text{ That if 28 apples are divided into } \underline{28} \\
 \quad \quad \quad \text{groups with 7 in each group, there} \\
 \quad \quad \quad \text{will be 4 groups.}
 \end{array}$$

This twofold aspect of division should be pressed home and developed from the tables before proceeding further.

Given the whole number and the number of groups, division enables us to find the **number of articles in each group**; or,

Given the whole number and the number of articles in each group, division enables us to find the **number of groups**.

28. Short or Long Division first?—*Shortened* forms of working should *succeed*, not *precede*, the *full* form of working; but as the Code places Short Division first, this rule should

first be taught by Long Division, and then the shortened form should be worked side by side with it.

By this means the method of Long Division will be acquired by children in connection with *small* divisors which present fewer difficulties; and the method of Short Division will be much more clearly grasped.

Division generally proves a stumbling-block to children, and few children can give a satisfactory explanation of the process, because—

- (1) The rule is not approached in carefully graded steps.
- (2) The principle is not taught through concrete illustrations, with each step of the working actually *performed* in the concrete.
- (3) The idea of division as the splitting up of a number into *equal groups* (the one more easily grasped) is not kept before the children.

29. Short Division.—This subject should be attacked in the following stages:—

First Stage. Division without Remainders:

- (a) Tens and units only; *e.g.* $48 \div 4$.
- (b) Hundreds, tens, and units; *e.g.* $846 \div 2$.

Second Stage. Division with Remainders:

- (a) Remainder from tens; *e.g.* $36 \div 2$.
- (b) Remainder from hundreds; *e.g.* $728 \div 4$.
- (c) Remainder from hundreds and tens; *e.g.* $354 \div 6$.

Third Stage. Division of Thousands:

The division of hundreds, tens, and ones of thousands should be taught as a *repetition* of the previous stages with *another unit*, viz. thousands.

30. OUTLINE OF A LESSON ON DIVISION WITH REMAINDERS.

Example: $540 \div 4$.

Knowledge assumed.—Ability to divide without remainders.

First Step. The Sum stated.—Set out 540 in a concrete form, with tablets, sticks, &c. Put the sum in a concrete form, *e.g.*—

“540 marbles are to be divided among 4 boys. How many marbles will each boy receive?”

Let the tablets, sticks, &c., represent the marbles, and call 4 boys to the front to perform the division.

Second Step. Mental Exercises.—Have ready to hand the means of representing any number in the concrete; then go through the following exercises, in each of which the 4 boys take part:—

(a) Set out 40 as 4 tens: this number is divided by each boy taking 1 ten.

(b) Set out 80 as 8 tens: this number is divided by each boy taking 2 tens.

(c) Set out 60 as 6 tens: each boy takes 1 ten; but 2 tens remain, and these, *in their present form*, cannot be divided amongst 4 boys. Lead the boys to suggest changing the 2 tens into 20 ones. These are now divided, each child taking 5 ones.

60 divided amongst 4 boys gives each boy 1 ten 5 ones = 15.

(d) Set out 400 as 4 hundreds: this is divided by each boy taking 1 hundred.

(e) Set out 800 as 8 hundreds: this is divided by each boy taking 2 hundreds.

(f) Set out 600 as 6 hundreds: each boy takes 1 hundred; but 2 hundreds remain; and these, *in their present form*, cannot be divided.

The children suggest changing them into 20 tens. These tens are then divided, each boy taking 5 tens.

600 divided amongst 4 boys gives each boy 1 hundred 5 tens = 150.

Third Step. The Sum worked.—Now revert to the original sum; let the boys divide the concrete representation amongst them, first dividing the hundreds, then the tens, then the units. Arrange the sum in the form shown.

Long Division.

Number of boys.	Whole number			Number each boy had.
	H.	T.	U.	
4)	5	4	0	(1 3 5
	4	:	:	
	1	4	:	
	1	2	:	
	2 0			
	2 0			
			
	<u>150</u>			

Short Division.

Number of boys.	Whole number		
	H.	T.	U.
4)	5	4	0
	1	3	5
	<u>150</u>		

= number each boy had

(a) *Division of hundreds.*—Each boy takes 1 hundred, but cannot take more. Place the 1 hundred in the quotient.

4 hundreds have been divided amongst the 4 boys; these taken from the five hundreds leave 1 hundred, as shown. This, in its present form, cannot be divided.

(b) *Division of tens.*—Change the 1 hundred into 10 tens. These with the 4 tens of the original number make 14 tens to be divided. Show that this change of unit is effected by placing the tens figure beside the remainder from the hundreds.

From the 14 tens each boy can take 3 tens, but no more; place the 3 tens in the quotient.

4 boys, taking 3 tens each, have removed 12 tens. When these are taken from the 14 tens, 2 tens remain. These, in their present form, cannot be divided.

(c) *Division of units.*—Change the 2 tens into 20 ones. There are no ones to add to these. Call attention to the fact that the change of unit is effected by placing the ones figure beside the remainder from the tens.

20 ones enable each child to take 5 ones. Place the 5 in the quotient. 4 boys taking 5 ones each, remove 20 ones; and there is therefore nothing more to divide.

The division is complete; and each boy receives—

1 hundred, 3 tens, and 5 ones = 135 = **Ans.**

Fourth Step. The Rule stated.—From an examination of the steps of the working deduce the rule—

- (1) Divide each denomination separately.
- (2) When the division cannot be effected, reduce to the next lower denomination, and then divide.

Fifth Step. Exercises.—Give suitable exercises to be worked—

- (a) Step by step from the black-board with the teacher.
- (b) Afterwards independently.

From the worked example in short division the teacher will see the device adopted for effecting the change of unit, and preserving the similarity to long division.

We cannot too strongly urge the teacher to continue this full concrete teaching until the children have thoroughly mastered the principles involved.

31. Long Division.—The method is the same as that adopted in the above example. As the divisor is beyond 12

the difficulty of each separate division is increased, because the quotient has to be found *by trial* at each step; and when the quotient is found, the product of quotient and divisor has to be obtained by multiplication.

In the early stages do not take *large* numbers for the dividend; this but increases the difficulty. Take such numbers as you can readily represent in the *concrete*. When dividing by tens and units the method can be far better grasped by children if the dividend contains nothing beyond *hundreds*. The working is short, and every step in the process *can be worked in the concrete*. If the method be once grasped with a small number, its application to a large number is but the *repetition* of the step already learnt.

Care in selecting the divisors greatly reduces the difficulty of the early steps. With a small units figure the proper trial divisor is more easily found. Teachers should remember that divisors formed by numbers from 13 to 19 are really the *most* difficult.

The earliest examples should be so chosen that no *cyphers* occur in the quotient. Introduce these gradually.

The value of each figure in the quotient of our outline lesson has been shown by—

(1) Its concrete representation.

(2) By placing it under its correct denomination, H, T, or O.

Some adopt another plan, which we now illustrate—

$$\begin{array}{r}
 21 \overline{) 5964} \left(\begin{array}{l} 200 \\ 80 \\ 4 \end{array} \right. \left. \begin{array}{l} \\ \\ \end{array} \right\} 284 = \text{quotient.} \\
 \underline{4200} \\
 21 \overline{) 1764} \left(\begin{array}{l} 80 \\ 4 \end{array} \right. \left. \begin{array}{l} \\ \end{array} \right\} \\
 \underline{1680} \\
 21 \overline{) 84} \left(\begin{array}{l} 4 \end{array} \right. \left. \begin{array}{l} \\ \end{array} \right\} \\
 \underline{84} \\
 \dots
 \end{array}$$

32. Division by Factors.—Division by factors is applicable to but few sums; moreover, the rule is not easy to grasp, the remainders causing special difficulty.

Since Long Division has to be taught, it is perhaps better first to perfect the children in this rule, and then to treat division by factors as a *shortened* method applicable to certain sums.

OUTLINE OF A LESSON ON

DIVISION BY FACTORS.

Example: $5977 \div 21$.

Concrete form.—"How many groups of 21 boys can be made from 5977 boys?"

First Step. Factors.—Write down any parts of the multiplication table, *e.g.* $3 \times 7 = 21$; $6 \times 9 = 54$; $12 \times 4 = 48$; $8 \times 6 = 48$.

Call attention to the fact that 21 is obtained by multiplying 7 by 3; 54 is obtained by multiplying 9 by 6.

Tell that two numbers multiplied together to form another number are said to be *factors* of that number; hence 3 and 7 are the factors of 21.

Give practice in finding the factors of 36, 49, 81, &c.

Second Step. Mental Exercises solved by experiment.—Set out each number in the concrete by means of tablets, sticks, &c.; or use the children themselves. State each result on the black-board.

(1) (a) 24 children are put 4 in a group. How many groups?

One group = 4) 24 boys.

6 groups of 4.

Give a number of these.

(b) 26 children are put 4 in a group. How many groups?

One group = 4) 26 boys.

6 groups of 4 + 2 boys.

47 children are put 8 in a group. How many groups?

One group = 8) 47 boys.

5 groups of 8 + 7 boys.

(2) (a) 47 children are put 4 in a group. How many groups?

One group = 4) 47 boys.

11 groups of 4 + 3 boys.

(b) Now I put 2 of these smaller groups into one *large* group. How many groups?

One group = 4) 47 boys.

Groups of 4 = 2) 11 groups of 4 + 3 boys.

5 groups of 8 + 1 group of 4.

How many large groups of 8? *Ans.* 5 groups of 8.

How many boys? *Ans.* 1 group of $4 + 3$ boys } = 7 boys.
 $\qquad\qquad\qquad = 1 \times 4 + 3$

Compare this result with 1 (b) above. Note that 4 and 2 are the **factors** of 8. Hence, the same result is obtained when we divide by the *factors* of a number as when we divide by the number itself.

Note how the **remainder** is obtained.

• Work the same sum in the abstract, side by side with the concrete form.

$$\begin{array}{r} 8 \left\{ \begin{array}{l} 4 \overline{) 47} \\ 2 \overline{) 11} \end{array} \right. \dots\dots\dots + 3 \left. \vphantom{\begin{array}{l} 4 \overline{) 47} \\ 2 \overline{) 11} \end{array}} \right\} 7 = \text{remainder.} \\ \underline{\hspace{1.5cm}} 5 \text{ groups } \dots\dots\dots 1 \times 4 \end{array}$$

Third Step. The Sum worked.—Obtain from the children the factors of $21 = 7 \times 3$, and proceed to divide by each, as in the previous example.

$$\begin{array}{l} \text{One group} = 21 \left\{ \begin{array}{l} 7 \overline{) 5977} \\ 3 \overline{) 853} \end{array} \right. \dots 6 \text{ boys} \\ \text{Number of groups} = \underline{284} \dots 1 \text{ group of } 7 \left. \vphantom{\begin{array}{l} 7 \overline{) 5977} \\ 3 \overline{) 853} \end{array}} \right\} 13 \text{ boys.} \\ \qquad\qquad\qquad \qquad\qquad\qquad (= 1 \times 7) \end{array}$$

Ans. 284 groups and 13 boys.

Now work the sum by Long Division.

Fourth Step. The Rule stated.—Examine the steps of the working, and state the rule—

- (1) We divide by a number when we divide successively by its factors.
- (2) The whole remainder = (the last remainder \times the first divisor) + the first remainder.

Fifth Step. Exercises.—Give suitable exercises to be worked—

- (1) Step by step with the teacher.
- (2) Individually without aid.

Pay special attention to the divisors which will be needed in the compound rules of weights and measures, *e.g.* 14, 16, 20, 28, &c.

COMPOUND RULES.

33. Money.—The compound rules applied to money generally present far less difficulty than the simple rules; and as we have treated the four simple rules with some fulness, we must content ourselves with a slighter treatment of these.

The terms and the signs used are all familiar; they should, therefore, present little difficulty to the intelligent young teacher who has studied the previous pages.

The **tables** must be built up as the result of *actual observation*, and be well committed to memory. The **reduction** of money from one denomination to another must also have plenty of preliminary practice.

34. Compound Addition.—Show its analogy to the method of simple addition—

	10	10		20	12
H.	T.	O.	£	s	d
3	8	7	3	8	8
6	5	8	6	6	8
4	9	6	5	8	9
15	4	1	15	4	1

Take, in the earliest steps, additions which do not involve "carrying". Then take the remaining work in stages—

- (a) The addition of pence and farthings.
- (b) " " shillings, pence, and farthings.
- (c) " " pounds, shillings, pence, and farthings.

35. Compound Subtraction.—The method adopted in simple subtraction should be continued here, and the two rules should be worked side by side to show the close similarity in the method of procedure.

The *teaching* examples should be worked out, using the actual coins. The rule should be taught in the following stages:—

- (a) Subtraction without involving change ("borrowing").
- (b) " with "changing" from the pence only.
- (c) " " " " shillings only.
- (d) " " " " pounds only.
- (e) " " two or more "changings".

Note.—Never use the term "borrow" in *teaching*.

An illustrative example will show the methods of working. The decompositions and equal additions are shown in small figures placed above each term.

Example—£4, 8s. $7\frac{1}{2}d.$ - £2, 14s. $9\frac{3}{4}d.$

A. Decomposition Method.

(a) *Farthings*: $4f. - 3f. = \frac{1}{4}d.$;

$$\frac{1}{4}d. + \frac{1}{4}d. = \frac{1}{2}d.$$

(b) *Pence*: $12d. - 9d. = 3d.$;

$$3d. + 6d. = 9d.$$

(c) *Shillings*: $20s. - 14s. = 6s.$;

$$6s. + 7s. = 13s.$$

£	s	d
	20	12 4
3 4	7 8	6 7 1 4
2	14	9 3 4
	1 13	9 1 2 = difference.

B. Equal Addition Method.

(a) *Farthings*: $4 - \frac{3}{4}d. = \frac{1}{4}d.$;

$$\frac{1}{4}d. + \frac{1}{4}d. = \frac{1}{2}d.$$

(b) *Pence*: $12d. - 10d. = 2d.$;

$$2d. + 7d. = 9d.$$

(c) *Shillings*: $20s. - 15s. = 5s.$;

$$5s. + 8s. = 13s.$$

(d) *Pounds*: £4 - £3 = £1.

£	s	d
	20	12 4
4	8	7 1 4
12	14	19 3 4
	1 13	9 1 2 = difference.

36. Compound Multiplication.—The introductory teaching is similar to that followed in simple multiplication. To show that the rule is a shortened form of addition, work an example both by addition and multiplication.

When multiplication by *one* figure is learnt, there are three methods from which to choose in multiplying by higher numbers. An example will illustrate these:—

$$\bullet \text{ £15, 16s. } 10\frac{1}{2}d. \times 63.$$

Method A.—Multiplying the sum by the *multiples of 10*, and then taking the remaining part separately, *e.g.* $10 \times 6 + 3$.

Method B.—Multiplying by the *factors of the multiplier*, *e.g.* 9×7 ; or 7×9 .

Method C.—Multiplying separately each term of the price by the *whole multiplier*.

The teacher should adopt *one* method, and keep to it till it is thoroughly known. We give the example worked out by each method that the teacher may compare their relative advantages.

Method A.

£	s	d	
15	16	10 1 2	•
		10	
158	8	9	= top line $\times 10$
		6	
950	12	6	= „ $\times 10 \times 6$
47	10	7 1 2	= „ $\times 3$
998	3	1 1 2	= „ $\times 63$

Method B.

£	s	d	
15	16	10 1 2	
		9	
142	11	10 1 2	= top line $\times 9$
		7	
998	3	1 1 2	= „ $\times 9 \times 7$

Method C.

$ \begin{array}{r} \text{£} \quad \text{s.} \quad \text{d.} \\ 15 \quad 16 \quad 10\frac{1}{2} \\ \underline{\hspace{1cm}} \quad \underline{\hspace{1cm}} \quad \underline{\hspace{1cm}} \\ 63 \\ \text{Ans. } \underline{\underline{998}} \quad \underline{\underline{3}} \quad \underline{\underline{1\frac{1}{2}}} \text{ Product.} \end{array} $	<p><i>Working</i>—</p> $ \begin{array}{r} 4 \overline{) 126 \text{ far.}} \\ \underline{31} \dots \frac{1}{2} d. \\ 630 \\ 12 \overline{) 661 d.} \\ \underline{55} \dots 1 d. \\ 378 \\ 630 \\ 2,0 \overline{) 106 \frac{3}{4} s.} \\ \underline{53} \dots 3 s. \\ 315 \\ 630 \\ \underline{\underline{£998}} \end{array} $
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37. Compound Division.—Long division should again precede short division unless, as before, the teacher work both methods side by side. Practice in reducing pounds to shillings, shillings to pence, and pence to farthings should precede this rule.

Attack the rule in the following stages:—

First Stage. One reduction only.

<p>(a) £34, 4s. ÷ 36.</p> <p><i>Ans.</i> 19s.</p>	<p><i>Working</i>—</p> $ \begin{array}{r} 36 \overline{) 34 \frac{4}{10}} \\ \underline{20} \\ 36 \overline{) 684} (19s. \\ \underline{36} \\ 324 \\ \underline{324} \\ \dots \end{array} $
<p>(b) 17s. 5d. ÷ 19.</p> <p><i>Ans.</i> 11d.</p>	$ \begin{array}{r} 19 \overline{) 17 \frac{5}{4}} \\ \underline{12} \\ 19 \overline{) 209} (11d. \\ \underline{19} \\ 19 \\ \underline{19} \\ \dots \end{array} $

$$(c) 11\frac{1}{2}d. \div 23.$$

$$\bullet \text{ Ans. } \frac{1}{2}d.$$

$$\begin{array}{r} d. \\ 11\frac{1}{2} \\ 4 \\ 23 \overline{)46} (\frac{1}{2}d. \\ 46 \end{array}$$

• *Second Stage. Two reductions.*

$$(a) \text{ £}5, 10s. 0d. \div 24.$$

$$\text{Ans. } 4s. 7d.$$

$$\begin{array}{r} \bullet \\ \text{£} \quad s \quad d. \quad \text{£} \\ 24 \overline{)5100} (0 \\ 20 \\ 24 \overline{)110} (4s. \\ 96 \\ 14 \\ 12 \\ 24 \overline{)168} (7d. \\ 168 \end{array}$$

$$(b) 18s. 6\frac{3}{4}d. \div 27.$$

$$\text{Ans. } 8\frac{1}{4}d.$$

$$\begin{array}{r} s. \quad d. \\ 27 \overline{)186\frac{3}{4}} (0s. \\ 12 \\ 27 \overline{)222} (8d. \\ 216 \\ 6 \\ 4 \\ 27 \overline{)27} (\frac{1}{4}d. \\ 27. \end{array}$$

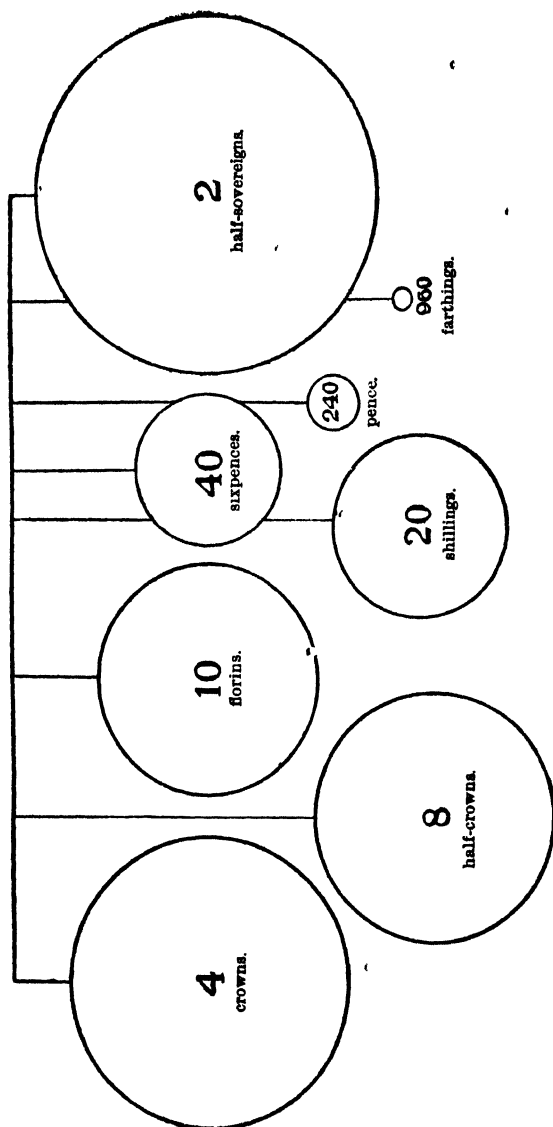
• *Third Step.—Three reductions.*

$$\text{£}121, 13s. 8d. \div 49. \text{ Ans. } \text{£}2, 9s. 8d.$$

38. Reduction.—The more complex forms of reduction dealing with guineas, half-crowns, florins, &c., may now be undertaken. What we want to impress upon the children is that the **value** of the money is *not* altered; what is altered is simply the **number of coins** in which the value is expressed. A diagram, such as that now given, is helpful.

Children must be taught to aim at getting the required result in the shortest number of steps. They, therefore, need a clear grasp of the relationship existing between the different coins. This is, perhaps, best shown by the use of the “ladder table”.

£1



The ladder should be formed by the children as the result of *actual observation*.

Before a sum is begun, the table should be written to show the steps by which the result is to be obtained.

39. Weights and Measures.—Long and square measures, which involve the use of fractions, are now, very properly, to be taught in conjunction with Fractions. There is, therefore, no new principle to be taught in connection with Weights and Measures. Indeed, Reduction alone is required in Course A, although Course B requires the use of the four rules.

The methods of working are exactly the same as we have been considering in relation with money; the only new point is to acquire a knowledge of the tables. No weight or measure is asked for beyond those with which the children are familiar, at least by *name*.

What we have to do, then, is to show the relation which exists between the different measures.

As in all our previous work this knowledge must be the result of **observation** and **experiment**; and the table must be built up *by the children*. Most of the weights and measures required, if not already in the school, can be borrowed from an obliging shopkeeper.

We now give an outline of a lesson to show how a table should be taught.

40. OUTLINE OF A LESSON ON

LONG MEASURE—THE YARD, FOOT, AND INCH.

Apparatus—Draper's yard-stick and foot-rule.

First Step. Why Measures are used.—Lead children to see the inconvenience which would arise if there was no standard of measurement, *e.g.* a woman buying cloth for a dress, a carpet for a floor, curtains for windows, &c. Picture the builder without the means of expressing measurements accurately.

Second Step. The Measures used.—By assumed purchases, *e.g.* calico of the draper, beading of the picture-framer, &c., draw from the children that the yard, foot, and inch are the measures in most common use.

Third Step. The Table formed:

(a) **The Yard.**—Show a draper's yard-stick, or a substitute for it. The length of this is determined by a standard yard kept in the Houses of Parliament. Show other measures of the same length, *e.g.* the yard-tape. Let the children take the measurements of things which the teacher has previously ascertained to be an exact number of yards, *e.g.* the wall of the room.

(b) **The Foot.**—Measure other things which are not exact multiples of the yard; hence deduce the need of a *smaller* measure. Show the foot-rule, and measure the stick with it. The stick is seen to contain the foot-rule exactly three times; therefore, 1 yd. = 3 feet.

Take measurements with the foot-rule, and express the result first in feet, then in yards and feet.

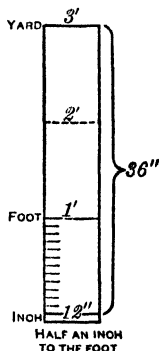
(c) **The Inch.**—Measure a book with a foot-rule. The rule is seen to be too long. Examine the rule, and note its division into 12 equal parts called inches; therefore 1 foot = 12 inches. Measure small articles, expressing their length in inches. Take other measurements expressing the result first in inches, then in feet and inches.

Show that there are 36 inches in the yard-stick and in the yard-tape.

(d) **Results collected.**—Collect the facts ascertained by experiment, and arrange in the ladder form. Then commit to memory.

(e) **Abbreviations.**—Give the abbreviations in use for these terms—**yd.**, **ft.**, **in.** Also 2' 3" = 2 ft. 3 inches.

Fourth Step. Exercises.—Give suitable questions in measurements and in calculating the cost of articles of a given length, *e.g.*—Cost of 3 yds. 1 ft. of lead pipe at 3d. per yard.

**SUMMARY.**

1. There are two Schemes of Work. Scheme B, in the lower standards, deals with small numbers.

2. Copying may be occasioned by lax supervision, want of clearness in the teaching, lack of special attention to backward scholars, misjudging the children's capacity, or undue severity.

3. Teaching and Revision Examples are necessary, and should be prepared by the teacher.

4. Paper work tends to secure neatness, accuracy, and thoughtful work
5. The source of inaccuracy must be discovered when correcting sums.
6. Problematic work, both mental and written, is of great value.
7. Numeration and Notation must be taught by means of concrete objects.
8. A system of mental additions must be taught.
9. Subtraction may be taught by the method of Decomposition, by Equal Addition, or by Complementary Addition.
10. The system of "Borrowing" should be discarded.
11. Tables must be taught as the direct result of observation.
12. Multiplication is the sum of the repeated additions of the same number.
13. Short division should be first taught by the method of long division.
14. Every process in division must be shown in the concrete.
15. Show the close similarity between the working of the simple and the compound rules.
16. Compound subtraction may be worked by the same three methods as simple subtraction.
17. The tables of Weights and Measures must be taught experimentally.

GOVERNMENT QUESTIONS.

1. Describe the best system you know for teaching notation.
2. Describe a ball-frame for teaching arithmetic, and show how it can be employed in teaching short division, with or without remainders.
3. Of the two methods of explaining subtraction—(1) Equal Addition, (2) Decomposition—which do you prefer, and why? Illustrate your answer by an example fully worked out.
4. How would you give a first lesson on "carrying" in subtraction? Take as an example $47 - 29$.
5. How may the ball-frame be used to teach the multiplication table?
6. State what sort of pictorial or other visible illustrations you would use in teaching the elements of arithmetic to very young children, and show what use you would make of such illustrations.
7. Multiply 74,086 by 909, and explain, as to a class, the process of working, and the separate value of each line of figures.
8. In teaching First Standard children to add mentally 23 and 18, into what groups would you lead them to break up either or both numbers?
9. Show that "Long Division" and "Short Division" are really the same in principle. In teaching "Division" (slate work) which of these "rules" would you begin with? Give your reasons.
10. At what point in your teaching of arithmetic would you introduce "rules" and require them to be learnt? Give a sketch of a model lesson on "division by factors", showing when and how you would teach the rule for that operation.
11. Take the following sum in long division: $£72,185, 13s. 2d. \div 163$, and work it so as to show fully the value of each separate figure in the answer, and of each remainder.

12. What useful purpose is served by analysing a sum in arithmetic and showing the separate value of each figure? Illustrate your answer by working the following question in long division: $537,682 \div 37$.

13. What is the use of "a problem" as an exercise in arithmetic? Frame two questions containing a problem for *each* of these three standards—the third, the fourth, and the fifth.

14. The New Code requires an exercise in rapid addition. Make out a column of figures suited for this exercise, and say how you would best secure quickness and accuracy in performing it.

15. What objects should be kept in view in the teaching of mental arithmetic? Say how these objects may be best attained, and give some examples of good oral exercises suited to the second standard.

16. Multiply £79, 13s. 8 $\frac{1}{2}$ d. by 486. Specify the various methods by which this sum might be worked. Which of these would you teach your scholars to use in ordinary practice? Why? Work out the sum by this method, explaining the principle and the steps of the process, as you would to your class.

CHAPTER XIV.—SENIOR ARITHMETIC.

I. Order of Teaching.—Our present chapter will embrace the work of the Upper Division of the school. We shall devote our attention chiefly to the teaching of *principles*, leaving their application to the higher rules to the teacher; for when *principles* are understood the application of them is not difficult.

Since Practice and the Rule of Three necessitate a clear idea of Fractions, it is, on the whole, better for the teacher to *start* with the latter rule.

An elementary knowledge of decimals is required in the lowest portion of this group, in order that scholars may "know the principles of the metric system, and be able to explain the advantages to be gained from uniformity in the method of forming multiples and sub-multiples of the unit" (*Schedule II.*).

This may well be given before the other work is begun, and whilst the idea of the decimal system of notation is fresh in the children's memories.

We shall, however, treat the subject at a later stage.

2. Apparatus.—Fractions, mensuration, &c., will require the use of apparatus prepared by the teacher. Strips and surfaces of differently coloured papers mounted on linen and accurately divided, are most servicable for our purpose. Remembering that a fraction is an *equal* part of the whole, the extreme difficulty of *exactly* dividing apples, &c., is at once apparent. The children would have to be told they must

regard each division as exactly equal. With paper strips this difficulty disappears.

Write on the back of each the point it is designed to illustrate, and keep it for future use.

3. The Greatest Common Measure.—Treat this rule experimentally. Provide strips of coloured paper 2", 3", 4", 6", 9", 12", and 18" in length.

First Step. A Measure:

(a) Take the 2" piece and show it is contained in the 12" piece an *exact* number of times. Do the same with each of the following pieces—3", 4", and 6". Tell that a *number which is contained in another number an exact number of times is said to be a measure or factor of that number*. Therefore 2, 3, 4, and 6 are measures of 12.

Second Step. A Common Measure:

(b) In the same way show that the pieces of 2", 3", 6", and 9" measure the piece of 18", and therefore 2, 3, 6, and 9 are **measures** of 18. But the pieces of 2", 3", and 6" also measured the piece of 12".

Show that the 9" piece will not measure the 12" piece. Therefore the pieces of 2", 3", and 6" are the only pieces which measure both the pieces of 12" and 18".

Therefore 2, 3, and 6 are measures *common* to both 12 and 18. Tell that a *number which measures two or more numbers is said to be a Common Measure of those numbers*.

Therefore 2, 3, and 6 are Common Measures of 12 and 18.

Third Step. Greatest Common Measure:

Take the three strips 2", 3", and 6" and place one on the top of the other. Each is a common measure of 12 and 18; but 3" is seen to be a greater measure than 2", and 6" is seen to be the *greatest* measure of all.

Try pieces of other lengths, and show that *no piece longer than 6" will measure both 12" and 18"*.

The 6" piece is therefore said to be the **Greatest Common Measure** of 12" and 18".

Examine what has been done, and state that **The Greatest Common Measure is the greatest number which is contained in two or more numbers an exact number of times**.

Fourth Step. The sum worked:

Since measures are factors of numbers, split each number

into its prime factors. The greatest factor which is common to all will be the Greatest Common Measure.

See the meaning of "prime factor" is known, and then give several exercises such as the following:—

(a) G.C.M. of 12 and 18.

$$12 = 2 \times 2 \times 3 = 2 \times 6.$$

$$18 = 2 \times 3 \times 3 = 3 \times 6.$$

The greatest factor common to both is 6.

$$\therefore \text{The G.C.M.} = 2 \times 3 = 6.$$

(b) G.C.M. of 18, 27, and 36.

$$18 = 2 \times 3 \times 3 = 2 \times 9.$$

$$27 = 3 \times 3 \times 3 = 3 \times 9.$$

$$36 = 2 \times 2 \times 3 \times 3 = 4 \times 9.$$

The greatest factor common to all three is 9.

$$\therefore \text{G.C.M.} = 3 \times 3 = 9.$$

Fifth Step. The Rule stated.—To find the G.C.M., split each number into its prime factors. The product of the factors common to all the numbers is the G.C.M. of those numbers.

The rules by which it may be seen whether a number is divisible by 2, 3, 4, 5, 8, 9, or 11 should be taught.

When the rule is well grasped, the common method of finding the G.C.M. by division may be taught, if thought desirable.

4. The Least Common Multiple.—In teaching this rule also, we shall find the coloured strips helpful.

First Step. A Multiple:

Take a strip of 12" and measure it by one of 6". 12" contains 6" an *exact* number of times.

Take a strip of 15" and measure it by one of 5". 15" contains 5" an *exact* number of times.

Take other examples; then tell that a number which contains another number an exact number of times is said to be a **Multiple** of that number.

Therefore 12 is a multiple of 6; and 15 is a multiple of 5.

Work other exercises.

Second Step. A Common Multiple:

By taking strips of 4" and 3" show that 12 is a multiple of 4 and 3 as well as of 6. Tell that since 12 is measured in common by 4, 3, and 6, it is said to be a **Common Multiple** of those numbers,

State that **A Common Multiple** is a number which contains two or more numbers an exact number of times.

Show also that 15 is a common multiple of 3 and 5.

The prime factors of 6 are 3 and 2. Show that 12 is also a common multiple of 3 and 2; and, by the examination of a number of examples, show that *the multiple of a number must also be a multiple of the prime factors of that number.*

Third Step. The Least Common Multiple:

Take strips of 24" and 36", and show that each of these is a common multiple of 6, 4, and 3. Therefore 12, 24, and 36 are all common multiples of 6, 4, and 3.

By measuring with strips less than 12", show that *no number less than 12* is measured by 6, 4, and 3. Therefore 12 is said to be the **Least Common Multiple** of 6, 4, and 3.

Examine the working, and state that **The Least Common Multiple** of two or more numbers is the smallest number which is exactly divisible by each of those numbers.

Fourth Step. The Sum worked:

We have seen that a common multiple of two or more numbers must contain all the prime factors of those numbers. If, therefore, we find a number which contains *only* the prime factors found in the given numbers, this number must be the **Least Common Multiple**. Let us find the L.C.M. of 6, 4, and 3.

The prime factors of 6 are 2, 3.	<div style="display: inline-block; vertical-align: middle; border-left: 1px solid black; padding-left: 10px;"> <p>The L.C.M. to contain 6 must contain the factors 2 and 3; and to contain 4, it must contain the factor 2 twice; and to contain 3, it must contain the factor 3.</p> <p>\therefore The L.C.M. = $2 \times 3 \times 2 = 12$.</p> </div>
" " 4 " 2, 2.	
" " 3 " 3.	

Fifth Step. The Rule stated:

Work other examples; and, from an examination of the working, state the Rule.

Split each number into its prime factors. Take each of the different prime factors found in the given numbers. If a prime factor is repeated more than once in any one number, it must be repeated in the L.C.M. as many times as the greatest number of times it occurs in the number in which it is most often found. Multiply these factors together to form the L.C.M.

Show, side by side, the two methods of working—

$\begin{array}{rcl} 6 & = & 2 \times 3 \\ 4 & = & 2 \times 2 \\ 3 & = & 3 \end{array}$	$\begin{array}{r} 3 \overline{) 6, 4, 3} \\ 2 \overline{) 2, 4, 1} \\ \hline 1, 2, 1 \end{array}$
$\text{L.C.M.} = 2 \times 2 \times 3 = 12.$	$\text{L.C.M.} = 2 \times 2 \times 3 = 12.$

Shortened forms of working should not be shown till the method is thoroughly grasped.

FRACTIONS.

5. The Fraction.—We are now prepared to commence our study of fractions. The work may be taken up in the following steps:—

First Step. The Notion conveyed:

Take three strips of paper of different colours, but of the same length. Hold up 1 strip. "How many strips are here?" *One Strip.* (Note.—Impress the idea of the "whole" or "unity".)

Take another strip, and tear off pieces of *unequal* length. Show one of these pieces, and let children tell that it is a *part* of a strip.

Take the third strip and fold it very carefully into four *exact* parts; then cut it. Hold up one piece, and let children tell, as before, that it is a *part* of a strip.

Show the *unequal* parts in one heap and the *equal* parts in another. In both heaps each piece is a *part*. Can children see any difference between the parts in one piece and the parts in another? Get a boy to examine one heap to find what he can about the parts in it in regard to their length; and get another boy to examine the other heap to do the same; so lead the children to see that all the parts in one heap are *equal*, but are not so in the other.

Tell that the *equal* parts of a whole are called *fractions*; but that the *unequal* parts are simply called pieces, parts, or fragments. Cut up other strips, and let the children tell whether the parts are *fractions* or not.

Second Step. How Fractions are named:

(a) Take strips of equal length, and cut into 2, 3, 4, &c., *equal parts*,

The teacher shows the inconvenience which would result if no name existed for distinguishing one fraction from another.

By reference to 10s., 5s., 4s., 2s., 1s., &c., as fractions of £1, he leads the children to see that *fractions are named according to the number of equal parts into which the whole is divided.*

Let the children now examine the fractions in each heap, and supply the correct name for each. Give other children strips and ask one to cut a half, another a fourth, another a fifth, &c.

(b) Fold a strip carefully into 8 equal parts, *but do not cut it.* Show one division. "What is the name of this fraction?" "*One-eighth.*" Show the next division. This is also one-eighth.

Now show both divisions *together.* "What fraction of the whole is this?" "*Two-eighths.*" In the same way get other fractions named.

Third Step. How Fractions are written:

Ask the children to write one farthing, two farthings, and three farthings ($\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$). Question on the meaning of the 2 and 4, and elicit that these figures represent *the number of equal parts into which the whole penny is divided.*

Since these figures indicate the name of the fraction, tell that they are called the **naming-part** or **Denominator.**

Question on the meaning of the 1 and 3, and elicit that these tell the *number of equal parts of the whole taken to form the fraction*; and that, therefore, these figures form what is called the **numerator** of the fraction (*numerus = number*).

Represent the fraction thus—**Fraction** $\frac{3}{4}$ **Numerator.**
Denominator.

Turn to the heaps of fractions. Select some, and let the children write their value on the black-board.

Fourth Step. The Definition:

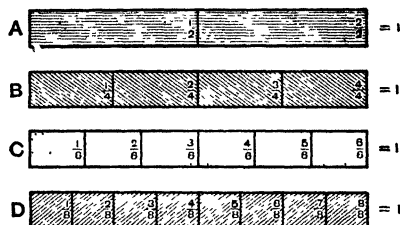
Lead the children to form some such definition as the following:—

A Fraction is one or more equal parts of a whole.

We have treated this section somewhat fully, as the right understanding of the nature of a fraction is essential to future progress.

6. Comparison of Fractions—Cancelling.—This is another very important step, and should be carefully and fully taught.

Take strips of the *same* length, but of *different* colours, and very carefully fold one strip into 2 equal parts, another into 4, another into 6, and the last into 8. Mark the value of each fraction as shown in the accompanying sketch.



First Step. Effect of Multiplying Numerator and Denominator by the same number:

Cut off $\frac{1}{2}$ of strip A. Place this part in succession upon strips B, C, and D, and cut off equal lengths. Each of these fractions is therefore equal to a half of the whole.

Now examine the value of the fractions marked on the strips, and write them on the black-board thus—

$$(a) \frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8}$$

Next split up the numerators and denominators of the fractions into factors as shown in (b)—

$$(b) \frac{1}{2} = \frac{2}{4} = \frac{1 \times 2}{2 \times 2}$$

$$\frac{1}{2} = \frac{3}{6} = \frac{1 \times 3}{2 \times 3}$$

$$\frac{1}{2} = \frac{4}{8} = \frac{1 \times 4}{2 \times 4}$$

Call attention to the final form in each case. Note that in the first case, numerator and denominator are multiplied by 2, in the second by 3, and in the third by 4; yet each fraction equals $\frac{1}{2}$.

Hence deduce that *the numerator and denominator of a fraction may be multiplied by the same number without altering its value.*

Find fractions equivalent to $\frac{3}{4}$, $\frac{7}{8}$, &c.

Second Step. Effect of Dividing Numerator and Denominator by the same number:

Reverse the process of the previous step. Take the same four strips, but *first* write down the value expressed on each;

and show by division how each is brought to the same value, $\frac{1}{2}$, thus—

$$\begin{aligned}\frac{1}{2} &= \frac{1}{2} \\ \frac{2}{4} &= \frac{2 \div 2}{4 \div 2} = \frac{1}{2} \\ \frac{3}{6} &= \frac{3 \div 3}{6 \div 3} = \frac{1}{2} \\ \frac{4}{8} &= \frac{4 \div 4}{8 \div 4} = \frac{1}{2}\end{aligned}$$

The $\frac{2}{4}$ has its numerator and denominator \div by 2; the $\frac{3}{6}$ by 3, and the $\frac{4}{8}$ by 4, giving the fraction $\frac{1}{2}$ in each case. The truth of this is shown by superimposing the fractions.

Hence deduce that the numerator and denominator of a fraction may be **divided** by the same number without altering its value.

Tell that the process is called **Cancelling**: and show the usual method—

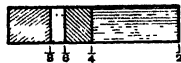
$$\frac{\cancel{2}}{\cancel{4}} = \frac{\cancel{2}}{\cancel{4}} = \frac{1}{2}$$

Find, by cancelling, fractions equivalent to $\frac{3}{6}$, $\frac{4}{10}$, $\frac{3}{12}$, &c.

Third Step. Comparison of Fractions:

(a) *With the same denominator.*—Take strip B, and by a comparison of the fractions $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$ show that *when the denominators are the same, the greatest fraction has the greatest numerator.*

(b) *With the same numerator.*—Place $\frac{1}{8}$ of D upon $\frac{1}{6}$ of C, and these upon $\frac{1}{4}$ of B, and finally the whole upon $\frac{1}{2}$ of A. The different colours of the strips will plainly show the difference in the values; and the children will see that *when the numerators are the same the greatest fraction has the least denominator.*



Compare in the same way $\frac{2}{8}$, $\frac{2}{6}$, $\frac{2}{4}$, and $\frac{2}{2}$.

(c) *Equal fractions with different numerators and denominators.*

Take the fractions $\frac{3}{4}$ and $\frac{6}{8}$. There is nothing in common between these two. What is to be done?

Cut $\frac{3}{4}$ from strip B, and lay it upon strip D. $\frac{3}{4}$ is seen to be exactly equal $\frac{6}{8}$. Yet from the *written* fraction we could not see this. From the written fraction we can tell which is the

larger only when either the numerators or the denominators are the same. Can we get the *denominators the same*?

From the First Step the children suggest multiplying the numerator and denominator of $\frac{3}{4}$ by 2; $\frac{3}{4} = \frac{3 \times 2}{4 \times 2} = \frac{6}{8}$. Now the equality is evident.

Hence deduce that *to compare fractions we must bring them all to the same denominator.*

(d) *Unequal fractions.*

Lastly compare two fractions which are *not* equal, e.g. $\frac{5}{6}$ and $\frac{7}{8}$.

Take $\frac{5}{6}$ of C, and $\frac{7}{8}$ of D. Take another strip E divided into 24 equal parts.

Lay $\frac{5}{6}$ of C upon E, and it is shown to be equal to $\frac{20}{24}$.

„ $\frac{7}{8}$ of D „ E, „ „ $\frac{21}{24}$.



Show that the denominator 24 is the L.C.M. of the denominators 6 and 8.

Hence deduce the **Rule**.—*To compare fractions we must change them into equivalent fractions in which the denominator is the L.C.D. of all the denominators of the fractions.*

$$\frac{5}{6} = \frac{5 \times 4}{6 \times 4} = \frac{20}{24}$$

$$\frac{7}{8} = \frac{7 \times 3}{8 \times 3} = \frac{21}{24}$$

7. Addition and Subtraction.—These follow naturally from the preceding exercise. But before beginning these rules, it will be necessary to make the children acquainted with the nature of an **Improper fraction** and a **Mixed number**.

The steps in teaching addition or subtraction would be—

(1) The addition of fractions with the *same* denominator, e.g. $\frac{1}{8} + \frac{3}{8}$.

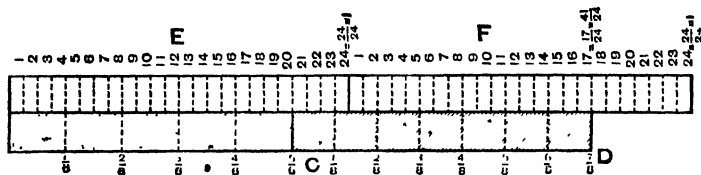
(2) Changing fractions to equivalent fractions with a *common* denominator, e.g. $\frac{5}{6} + \frac{7}{8} = \frac{20}{24} + \frac{21}{24}$. (Steps 1 and 2 have been explained.)

(3) The final operation of addition or subtraction.

Subtraction.—The above diagram shows the difference between $\frac{7}{8}$ and $\frac{5}{8} = \frac{1}{4}$; and the children, therefore, see that the subtraction is accomplished as follows: **Rule.**—*Reduce the fractions to the least common denominator. Subtract the numerators to give the numerator of the answer, and take the common denominator for the denominator of the answer.*

Addition.—To show the value of the final addition, take another strip, F, divided into 24ths in the same way as strip E. Place E and F end to end; and, by the side of these, place $\frac{5}{8}$ of C and $\frac{7}{8}$ of D (the fractions to be added) end to end.

The two together are found to equal 1 whole strip and $\frac{1}{4}$ of another strip, or $\frac{4}{4} + \frac{1}{4}$ of a strip.



Hence deduce that addition is effected as follows: **Rule.**—*Reduce the fractions to the least common denominator. Add the numerators together to give the numerator of the answer, and take the common denominator for the denominator of the fraction.*

8. Multiplication.—For the first time children will get a *product* which may be *smaller* than the multiplicand; unless carefully explained, this proves a difficulty to children. The rule may be taught in the following steps:—

First Step. **Fraction \times whole number**, e.g. $\frac{3}{8} \times 4$.

Revise what is meant by 3×4 , viz. $3 + 3 + 3 + 3$.

Therefore, $\frac{3}{8} \times 4 = \frac{3}{8} + \frac{3}{8} + \frac{3}{8} + \frac{3}{8} = \frac{3 \times 4}{8} = \frac{12}{8}$. Show its truth with paper strips. Give other examples.

Hence deduce the **Rule.**—*To multiply a fraction by a whole number, we multiply the numerator of the fraction by the whole number.*

$$\text{But } \frac{3 \times 4}{8} = \frac{3 \times \cancel{4}}{2 \times \cancel{4}} = \frac{3}{2}$$

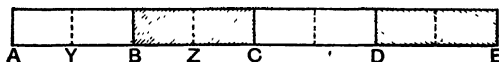
$$\text{and } \frac{3}{8 \div 4} = \frac{3}{2}$$

$$\text{Therefore } \frac{3}{8} \times 4 = \frac{3}{8 \div 4} = \frac{3}{2}$$

Hence deduce the **Rule**.—*To multiply a fraction by a whole number, multiply the numerator of the fraction or divide the denominator of the fraction by the whole number.*

Second Step. Whole number \times a fraction, e.g. $4 \times \frac{2}{8}$.

This is a difficult step. It means that 4 is repeated not once, but only $\frac{2}{8}$ of a time.



Illustrate thus: A boy walks 4 steps in 1 second. Every time the second is repeated he has walked the 4 steps. Let AB, BC, CD, and DE represent these 4 steps. Divide each of these steps into *half* steps as shown. Every time the second is repeated he walks the distance AE.

But suppose he is stopped before the whole second is repeated; e.g. when only $\frac{1}{8}$ of the second is repeated, i.e. in $\frac{1}{8}$ of a second; then it is evident he will have walked only $\frac{1}{8}$ of the whole distance, i.e. $\frac{1}{8}$ of 4 steps = AY. Therefore 4 repeated $\frac{1}{8}$ of a time = $\frac{1}{8}$ of 4.

If he is stopped when $\frac{2}{8}$ of the second is repeated, i.e. in $\frac{2}{8}$ of a second, then he will have walked $\frac{2}{8}$ of the whole distance, i.e. $\frac{2}{8}$ of 4 steps = AB. Therefore 4 repeated $\frac{2}{8}$ of a time means $\frac{2}{8}$ of 4.

If he is stopped when $\frac{3}{8}$ of a second is repeated, i.e. when 4 steps have been repeated $\frac{3}{8}$ of a time, he will have walked $\frac{3}{8}$ of 4 steps = AZ.

Impress on the children that $4 \times \frac{3}{8}$ means $\frac{3}{8}$ of 4.

$$\text{Therefore } 4 \times \frac{1}{8} = \text{AY} = \frac{1}{2} \text{ of a whole step} = \frac{4 \times 1}{4 \times 2} = \frac{4 \times 1}{8}$$

$$\text{,, } 4 \times \frac{2}{8} = \text{AB} = 1 \quad \text{,,} \quad = \frac{8}{8} = \frac{4 \times 2}{8}$$

$$\text{,, } 4 \times \frac{3}{8} = \text{AZ} = \frac{3}{2} \quad \text{,,} \quad = \frac{4 \times 3}{4 \times 2} = \frac{4 \times 3}{8}$$

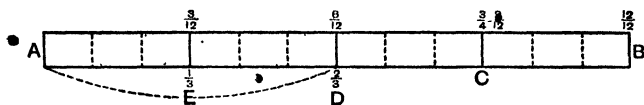
Hence deduce the **Rule**.—*To multiply a whole number by a fraction, multiply the whole number by the numerator and divide by the denominator.*

Alternative Proof.—The following is a much simpler proof— $4 \times 3 = 12$. But we have multiplied by a number 8 times too

great; therefore we must divide the result by 8, which gives $\frac{12}{8} = \frac{3}{2}$.

Third Step. Fraction \times a fraction, e.g. $\frac{3}{4} \times \frac{2}{3}$.

This means (1) that we are to take $\frac{3}{4}$ of a whole;
and (2) repeat this fraction $\frac{2}{3}$ of a time.



If AB is the whole, AC, which is $\frac{3}{4}$ of AB, is the fraction to be multiplied. We have to find the value of this fraction when it is repeated $\frac{2}{3}$ of a time, i.e. we have to find the value of $\frac{2}{3}$ of $\frac{3}{4}$. (This follows from Step 2.)

But AD is $\frac{2}{3}$ of $\frac{3}{4}$. Therefore the value of AD is the value required.

$$AE = \frac{1}{3} \text{ of } AC = \frac{1}{3} \text{ of } \frac{3}{4} = \frac{3}{12} = \frac{3 \times 1}{4 \times 3}$$

$$\text{and } AD = \frac{2}{3} \text{ of } AC = \frac{2}{3} \text{ of } \frac{3}{4} = \frac{6}{12} = \frac{3 \times 2}{4 \times 3}$$

Hence deduce the **Rule**.—To multiply a fraction by a fraction, multiply the numerators together for the new numerator and the denominators for the new denominator.

Alternative Proof.—The following proof is simple— $\frac{3}{4} \times 2 = \frac{3 \times 2}{4}$. (This follows from the First Step.) But we have multiplied by a number 3 times too great; therefore we must divide this fraction by 3. $\frac{3}{4} \times \frac{2}{3} = \frac{3 \times 2}{4 \times 3}$.

9. Division.—Simple examples must be chosen to illustrate the methods of working, or the illustrations will be complicated and difficult. Some children never seem to get a real grasp of this rule, because they cannot understand the quotient sometimes being *greater* than the dividend.

To counteract this, give, before commencing the rules, a few simple examples in whole numbers which will impress upon the children the idea that division is a method of finding how many groups with a certain number in each are contained in

another group, *i.e.* how many times or part of a time the value of one group can be subtracted from another group, *e.g.*—

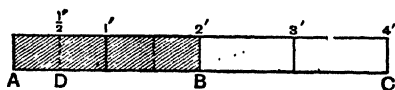
50 apples put 10 in a group. How many groups?

					$= 50 \div 10 = 5$ groups.
30	„	6	„	„	$= 30 \div 6 = 5$ „
20	„	5	„	„	$= 20 \div 5 = 4$ „
10	„	10	„	„	$= 10 \div 10 = 1$ „
5	„	10	„	„	$= 5 \div 10 = \frac{1}{2}$ „
3	„	12	„	„	$= 3 \div 12 = \frac{1}{4}$ „

*First Step. Fraction \div whole number, *e.g.* $\frac{1}{2} \div 2$.*

What we have to find is how many groups of 2 we can make out of $\frac{1}{2}$ of a whole. Evidently no groups can be made, but only a *part* of a group.

Put the question in the concrete: "A man walks 2 ft. in 1 step, how many steps will he take in walking $\frac{1}{2}$ a foot?"



Take a piece of paper AC, and divide it into 4 parts, as shown, to represent feet. Divide AB into four equal parts. Then AD = half a foot, and AD is seen to be $\frac{1}{2}$ of AB.

In going from A to C a man takes 2 steps	$= \frac{4}{2}$
„ „ A „ B „ 1 „	$= \frac{2}{2}$
„ „ A „ D „ $\frac{1}{4}$ „	$= \frac{1}{2 \times 2}$

Give other similar examples. Hence deduce the **Rule**.—
To divide a fraction by a whole number, multiply the denominator of the fraction by the whole number.

$$\text{Again, } AB = 2 \text{ ft.} = \frac{2 \times 2}{1 \times 2} = \frac{4}{2} \text{ ft.}$$

If in going from A to B, *i.e.* 2 ft., a man takes $2 \div 2$ steps = 1 step; then in going from A to B, *i.e.* $\frac{4}{2}$ ft., a man takes $\frac{4}{2} \div 2$ steps = 1 step.

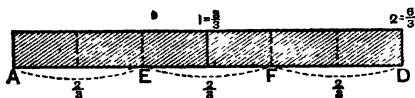
$$\text{But } \frac{4 \div 2}{2} = \frac{2}{2} = 1.$$

Hence deduce the **Rule**.—*To divide a fraction by a whole number, multiply the denominator or divide the numerator of the fraction by the whole number.*

Second Step. Whole number divided by fraction, e.g. $2 \div \frac{2}{3}$.

Put into a concrete form this means, "How many strips $\frac{2}{3}$ of an inch long can you cut from a strip 2 inches long?"

Take a strip AD 2" long, and divide each inch into 3 equal parts.



A strip $\frac{1}{3}$ of an inch long can be cut from 1 inch 3 times
 $= 1 \times 3$.

A strip $\frac{1}{3}$ of an inch long can be cut from 2 inches 6 times
 $= 2 \times 3$.

But a strip $\frac{2}{3}$ of an inch long is twice as long as a strip $\frac{1}{3}$ of an inch long. Therefore a strip $\frac{2}{3}$ of an inch long can be cut from 2 inches $\frac{2 \times 3}{2}$ times.

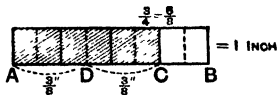
AE, EF, and FD are each equal to $\frac{2}{3}$ inch, and are cut from AD 2 inches long.

Deduce the **Rule**.—*To divide a whole number by a fraction, divide the whole number by the numerator and multiply by the denominator.*

Third Step. Fraction \div a fraction, e.g. $\frac{3}{4} \div \frac{3}{8}$.

Put in a concrete form this is, "How many strips $\frac{3}{8}$ of an inch long can be cut from a strip $\frac{3}{4}$ of an inch long?"

Take a strip 1" long, and carefully divide it into 4 quarters. AC is therefore $\frac{3}{4}$ of AB. We have to see how many strips $\frac{3}{8}$ " long can be cut from AC.



Divide AB into 8 equal parts; each part is then $\frac{1}{8}$ "; and AC is seen to contain 6 of these divisions.

Therefore $\frac{3}{4} \div \frac{1}{8}$ (i.e. the number of $\frac{1}{8}$ in $\frac{3}{4}$) $= \frac{3 \times 8}{4} = \frac{24}{4} = 6$.

But a strip $\frac{3}{8}$ " long is 3 times as great as a strip $\frac{1}{8}$ inch long; therefore the number of strips will be 3 times less than in the case with strips $\frac{1}{8}$ " long.

Therefore $\frac{3}{4} \div \frac{3}{8}$ (i.e. the number of $\frac{3}{8}$ in $\frac{3}{4}$) = $\frac{3 \times 8}{4 \times 3} = \frac{24}{12} = 2$.

The truth of this is seen from the above diagram, where AD and DC, each $\frac{3}{8}$ ", are seen to be exactly contained in $\frac{3}{4}$ ".

Deduce the **Rule**.—*To divide a fraction by a fraction divide the fraction by the numerator and multiply by the denominator.*

The children may now be shown that if we regard a whole number as a fraction whose denominator is unity (i.e. $2 = \frac{2}{1}$), the rule for division in any of the above instances may be thus expressed—

General Rule.—*To divide by a fraction invert the divisor and multiply.*

10. Complex Fractions.—In working these, the following points should receive careful attention—

(1) *Expressions within brackets* must be reduced to a single quantity before the bracket is removed, e.g.—

$$\frac{(\frac{1}{2} + \frac{2}{3}) \div 6}{(\frac{3}{4} - \frac{1}{2}) \div 3} = \frac{(\frac{3+4}{6}) \div 6}{(\frac{3-2}{4}) \div 3} = \frac{\frac{7}{6} \times \frac{1}{6}}{\frac{1}{4} \times \frac{1}{3}} = \frac{\frac{7}{36}}{\frac{1}{12}} = \frac{7}{36} \times \frac{12}{1} = \frac{7}{3}.$$

(2) *+ and - separate terms*. Therefore the signs \times and \div must first be removed.

If the above example had been written thus $\frac{\frac{1}{2} + \frac{2}{3} \div 6}{\frac{3}{4} - \frac{1}{2} \div 3}$, it would be wrong to work as in the above instance. The $\frac{2}{3}$ must first be divided by 6; and the $\frac{1}{2} \div 3$.

$$\frac{\frac{1}{2} + \frac{1}{9}}{\frac{3}{4} - \frac{1}{6}} = \frac{\frac{9+2}{18}}{\frac{9-2}{12}} = \frac{\frac{11}{18}}{\frac{7}{12}} = \frac{11}{18} \times \frac{12}{7} = \frac{22}{21} = 1\frac{1}{21}.$$

(3) *In the early stages do not attempt more than one operation at a time.*

Beginners will save many mistakes, if, at first, they are made to show each step *fully* as we have done in the above example. At a later stage they may be allowed to work the above example thus—

$$\frac{\frac{1}{2} + \frac{2}{3} \div 6}{\frac{3}{4} - \frac{1}{2} \div 3} = \frac{\frac{1}{2} + \frac{1}{9}}{\frac{3}{4} - \frac{1}{6}} = \frac{\frac{11}{18}}{\frac{7}{12}} = 1\frac{1}{21}.$$

(4) *Keep the fraction as one whole throughout*. Many mistakes are made by allowing children to pull the fraction to pieces,

and to solve parts of it separately, afterwards attempting to reconstruct the whole, *e.g.*—

$$\frac{1\frac{2}{7} + 2\frac{2}{3}}{6\frac{1}{2} + 3\frac{1}{3}} \times \frac{2\frac{1}{2} + 6\frac{1}{3}}{3\frac{4}{5} - 2\frac{2}{7}} = \frac{3\frac{6+14}{21}}{9\frac{3+2}{6}} \times \frac{8\frac{3+2}{6}}{1\frac{28-10}{35}} = \frac{8\frac{3}{21}}{\frac{5}{6}} \times \frac{5\frac{5}{35}}{\frac{5}{6}}$$

$$= \frac{8\frac{3}{21}}{\frac{5}{6}} \times \frac{8\frac{3}{21}}{\frac{5}{6}} \times \frac{8\frac{3}{21}}{\frac{5}{6}} \times \frac{8\frac{3}{21}}{\frac{5}{6}} = \frac{4\frac{1}{7}}{1\frac{7}{7}} = 2\frac{6}{7} \quad \text{Ans.}$$

Less liability to error will arise from the above method, than by first finding the value of $1\frac{2}{7} + 2\frac{2}{3}$, then the value of $6\frac{1}{2} + 3\frac{1}{3}$; then dividing the first by the second; and so on.

II. Reduction of One Quantity to the Fraction of Another.—From a few mental examples make clear to the children what is required in this exercise, *e.g.* Reduce 4s. to the fraction of £1. This means, “How many times or parts of a time is £1 contained in 4s.?” This is evidently expressed by the fraction—

$$\frac{4s.}{£1} = \frac{4}{20} = \frac{1}{5}.$$

Take other simple examples and lead the children to see that—

(1) **The Fraction required**

The Quantity to be reduced
= $\frac{\text{The Quantity to which it is to be reduced}}{\text{The Quantity to which it is to be reduced}};$

and (2) That both quantities must be **expressed in the same denomination**, and the resulting fraction *reduced to its lowest terms*.

PRACTICE.

12. This rule presents little difficulty, but requires careful and accurate working. Show that the rule is a *shortened form of multiplication*, and get the interest of your children by setting sums which will prove the great saving of labour it effects. Do not set sums which involve much working; these should be *occasionally given* as a test of speed and accuracy.

(1) **Simple Practice** deals with the value of *simple* quantities, *i.e.* quantities expressed in *one* denomination: *e.g.* 3 doz. books @ 17s. 6d. each; 57 tons @ £1, 11s. 6d. per ton.

After a few *mental* exercises, work some exercises by both practice and multiplication that the children may see the *saving of labour effected*, *e.g.* 75 sheep @ £1, 6s. 8d.

Multiplication.

£	s.	d.	
1	6	8	= cost of 1 sheep.
<hr/>			
	10		
13	6	8	= „ 10 „
<hr/>			
	7		
93	6	8	= „ 70 „
6	13	4	= „ 5 „
Ans.	<u>100</u>	<u>0</u>	<u>0</u> = „ 75 „

Practice.

	£	s.	d.	
6s. 8d. = $\frac{1}{3}$ of £1.	75	0	0	= cost @ £1 each.
	25	0	0	= „ 6s. 8d. each.
	<u>100</u>	<u>0</u>	<u>0</u>	= „ £1, 6s. 8d. each.

(a) First take all the aliquot parts of £1 which involve but **one** line of working, *e.g.* 10s., 6s. 8d., 5s., 4s., 2s. 6d., 2s., 1s. 8d., &c.

With these combine the £1, or any number of pounds, *e.g.* 57 @ £60, 15s. each.

(b) Next advance to sums of money which require **two** aliquot parts, *e.g.* 15s., 13s. 4d., 12s. 6d., &c.

(c) When the price is given in **shillings**, *e.g.* 38 @ 13s. 4d. each, there are two methods of working—

First Method.

	£	s.	d.	
10s. = $\frac{1}{2}$ of £1	38	0	0	= cost @ £1 each.
3s. 4d. = $\frac{1}{3}$ of 10s.	19	0	0	= „ 10s. each.
	6	6	8	= „ 3s. 4d. each.
Ans.	<u>25</u>	<u>6</u>	<u>8</u>	= „ 13s. 4d. each.

Second Method.

	s.	d.	
4d. = $\frac{1}{3}$ of 1s.	38	0	= cost @ 1s. each.
	13		
	<u>494</u>	0	= „ 13s. „
	12	8	= „ 4d. „
20)	506	8	
Ans.	<u>£25</u>		Ans. £25, 6s. 8d.

In taking aliquot parts for 17s. (= 10s. + 5s. + 2s.), where 2s. is $\frac{1}{5}$ of 10s. take care that the 10s. line (not the 5s.) is divided by 5.

The following example shows a neat yet complete form of arrangement.

Example. Cost of 45 tons at 17s. 3d. per ton—

s.	d.	£	s.	d.	£	s.	d.
		45	0	0 = cost @	1	0	0 each.
10	$0 = \frac{1}{2}$ of £1	22	10	0 =	0	10	0 "
5	$0 = \frac{1}{2}$ of 10s.	11	5	0 =	0	5	0 "
2	$0 = \frac{1}{5}$ of 10s.	4	10	0 =	0	2	0 "
0	$3 = \frac{1}{8}$ of 2s.	0	11	3 =	0	0	3 "
Ans.		<u>38</u>	<u>16</u>	<u>3 =</u>	<u>0</u>	<u>17</u>	<u>3 "</u>

Teach **shortened methods**, e.g. 3 doz. @ 4s. 11½d. each (i.e. 5s. - ½d.)

s.	d.	£	s.	d.	£	s.	d.
5	$0 = \frac{1}{4}$ of £1	36	0	0 = cost @	1	0	0 each.
		9	0	0 =	0	5	0 "
		0	1	6 =	0	0	0½ "
Ans.		<u>8</u>	<u>18</u>	<u>6 =</u>	<u>0</u>	<u>4</u>	<u>11½ "</u>

In the same way we work 3 doz. at £2, 19s. 11d. each (i.e. £3 - 1d.).

(2) **Compound Practice.**—We use this rule when we have to find the price of a *compound quantity*, that is, a quantity expressed in *several* denominations, e.g. 5 tons 16 cwt. 2 qrs. of hay at £3, 10s. per ton.

The only difficulty here is in finding the aliquot parts; but black-board demonstration will soon overcome this.

THE RULE OF THREE.

13. There are two methods of working sums in this rule (a) by First Principles, (b) by Proportion, or Statement, as it is sometimes called.

First Principles.—This method is but an application of compound multiplication and division; and, therefore, presents no difficulty in teaching.

It should be taught in the following steps:—

(1) **To find the value of 1 unit**, given the value of a number of units.

There are two forms, which should be taught separately—

(a) The *direct* form, *e.g.*—12 hats cost 36s. What will 1 hat cost?

(b) The *inverse* form, *e.g.*—In 18 days 24 men do a piece of work. In how many days will 1 man do the work?

(2) **To find the value of a number of units**, given the value of 1 unit.

(a) The *direct* form, *e.g.*—1 fowl costs 3s. What will 8 fowls cost?

(b) The *inverse* form, *e.g.*—A piece of work is done in 1 day by 24 men. How many men will do it in 6 days?

(3) **To find the value of a number of units when the value of a given number of units is known.**

(a) The *direct* form, *e.g.*—If £10 is earned in 50 days, how long will it take to earn £42?

(b) The *indirect* form, *e.g.*—A man borrows £200 for 6 months. How long ought he to lend his friend £20 in return?

14. Proportion.—This is a difficult rule, and will not be *intelligently* worked unless the teaching is full and clear, and the complete working is led up to, step by step. The most important step is to give the children a thorough grasp of **ratio**. We may do this by such teaching as the following:—

A. Ratio:

First Step. The Idea conveyed.—Take a yard-measure and a foot-rule. Here we have two *lengths*, one 3 ft., the other 1 ft. We may **compare** these lengths in two ways—

(1) By saying the 3 ft. length is 2 ft. *longer* than the 1 ft. length, *i.e.* by *subtraction*.

(2) By saying the 3 ft. length is 3 *times* the 1 ft. length, *i.e.* by *division*.

Give other examples to be compared in the *second* way, *e.g.*—

(a) The lengths of 2 desks, one 12 ft. and the other 6 ft.
 „ ages „ 2 boys, „ 18 yrs. „ „ 6 yrs.

(b) Now take examples in which the comparison will be expressed by a *part of a time*, e.g.—

The breadth of a room (18 ft.) compared with the length (36 ft.).

The days in a week (7) compared with the days in a month (28).

These examples should be multiplied until the method of comparison is well known.

Second Step. What Ratio is.—Question on what has been done, and deduce that we have compared two quantities by showing the number of times or parts of a time the first quantity is of the second quantity.

Tell that such a comparison is called a **ratio**.

Remind the children that in reducing one quantity to the fraction of another (v. 11, p. 267), they were really expressing the ratio of the two quantities.

Third Step. How a Ratio is written.—Take each of the above mental exercises, and show that we compared the two quantities by dividing the first quantity by the second.

Hence the ratio of the first desk to the second desk may be written thus, $\frac{18}{36}$. This is what we did in reducing one quantity to the fraction of another.

But $\frac{18}{36} = 18 \div 36$; and this has been altered into 18 : 36, which is the usual way of writing a ratio.

The value of the ratio 18 : 36 is, therefore, expressed by the fraction $\frac{18}{36} = \frac{1}{2}$, i.e. the first quantity is $\frac{1}{2}$ of the second quantity.

Give exercises in comparing quantities in the form of a ratio, and express the value of each ratio.

Show that in a ratio—

- (1) The quantities compared must be of the **same kind**, e.g. 2 apples cannot be contained in 3 oranges.
- (2) The quantities compared must be **reduced to the same denomination**, e.g. the ratio of 1s. 6d. to 2s. 8d. is 18 : 32; and its value is $\frac{18}{32}$.

- (3) Each term of a ratio may be multiplied or divided without altering its value, *e.g.* in the above example the ratio of 1s. 6d. to 2s. 8d. is expressed either by

$$\begin{aligned} &18 : 32 \\ \text{or } &9 : 16 \\ \text{or } &36 : 64; \end{aligned}$$

for the value of each of these ratios is $\frac{9}{16}$.

When the above work is understood, and plenty of exercises have been worked, the children are prepared to commence proportion.

B. Proportion:

First Step. Two Ratios may be Equal.—Give mental examples such as the following:—

- (a) The ratio of 1 week to 1 month is as 7 days : 28 days.
 „ „ 1 crown to 1 sovereign is as 5s. : 20s.

Here, in each case, the first term is $\frac{1}{4}$ of the second term; and the value of the ratio is expressed by the fraction $\frac{1}{4}$.

Therefore the ratio of 7 days to 28 days is equal to the ratio of 5s. to 20s.

- (b) The ratio of 1 stone to 1 cwt. is as 14 lbs. : 112 lbs.
 „ „ half a crown to £1 is as 30d. : 240d.

Here the first term of each ratio is $\frac{1}{8}$ of the second term; and the value of each ratio is expressed by the fraction $\frac{1}{8}$.

Therefore the ratio of 14 lbs. to 112 lbs. is equal to the ratio of 30d. to 240d.

Second Step. What Proportion is, and how it is written.—Tell children we may join two equal ratios together by writing them thus—

	days.		days.		shillings		shillings.
As	7	is to	28,	so is	5	to	20

Then show the usual form, and have it read—

	days.		days.		shillings.		shillings.
As	7	:	28	:	5	:	20

Tell that when two equal ratios are thus joined, the four quantities are said to be in **Proportion**, and that each of the quantities is called a **term** of the proportion. The *first* and *fourth* terms are called the **extremes**, and the *second* and *third* the **means**.

Third Step. The Properties of a Proportion.—Write down the above proportions, together with others—

	days.		days		shillings		shillings.
As	7	:	28	:	5	:	20
	lbs.		lbs.		d.		d.
As	14	:	112	:	30	:	240

From what they have already learnt of the structure of the proportion, the children know—

(1) **The first term** ÷ **the second term** = **the third term** ÷ **the fourth term.**

$$7 \div 28 = 5 \div 20.$$

The teacher now suggests that the children should multiply the *means* together, and then multiply the *extremes* together. He thus leads them to see that—

(2) **The product of the means** = **the product of the extremes.**

$$7 \times 20 = 28 \times 5.$$

$$14 \times 240 = 112 \times 30.$$

Fourth Step. Finding the Fourth Proportional.—The teacher now writes the first three terms of the above proportions, thus—

	days		days		shillings		shillings.
As	7	:	28	:	5	:	
	lbs.		lbs.		d.		d.
As	14	:	112	:	30	:	

From the statement (2) above, he leads the children to see—

(3) **The fourth term** = $\frac{\text{the second term} \times \text{the third term}}{\text{the first term}}.$

Give plenty of examples in finding the fourth proportional.

Fifth Step. The Rule of Three by the method of Proportion.
—Take one of the above proportions already formed by the teacher, *e.g.*—

	days		days		shillings		shillings.
As	7	:	28	:	5	:	[20]

and write the following sum on the black-board—

“If a boy is paid 5s. for 7 days’ work, how many shillings should he receive for 28 days’ work?”

Examine this sum, and note—

(a) We have three terms of the above proportion.

(b) Two of the terms are of the same kind—**days**; and there is one **odd term**—5s.

- (c) We are asked to find "*how many shillings*", i.e. to find a fourth term like the third term; or, in other words, to complete the second ratio.

Steps in the statement.—

Since the fourth term is *money representing wages*, the third term must be of the same kind, in order that it may form a ratio; therefore in stating a sum in the Rule of Three by proportion—

(1) Find out the term *corresponding to the answer* (here money representing wages), and **place it in the third term.**

(2) Let x , representing the answer, be placed in the **fourth term.** Then the second ratio is complete—

$$\begin{array}{ccccccc} & & & \text{shillings} & & \text{shillings.} & \\ \text{As} & : & : & 5 & : & x & \end{array}$$

Now x shillings is the wages for 28 days. Ought this to be more than 5s., the wages for 7 days? Clearly "Yes".

Then since the second term of the second ratio is **greater** than the first term, the second term of the first ratio must be greater than the first term.

Arrange thus—

$$\begin{array}{ccccccc} & \text{days} & & \text{days.} & & \text{shillings} & \text{shillings} \\ \text{As} & 7 & : & 28 & : : & 5 & : & x \end{array}$$

Therefore—

(3) *Examine the conditions of the sum, to see whether the fourth term should be **greater** or **less** than the third term, and arrange the first and second terms in the same way.*

(4) If the terms of the first ratio are not in the same denomination, *bring them to the same*; and, if possible, divide the terms of this ratio, e.g.—

$$\begin{array}{ccccccc} & \text{days.} & & \text{days} & & \text{shillings.} & \text{shillings.} \\ \text{As} & 7 & : & 28 & : : & 5 & : & x \\ \text{As} & 1 & : & 4 & : : & 5 & : & x \end{array}$$

(5) *Find the fourth term.* $x = \frac{4 \times 5}{1} = 20s.$

The advantage of taking a proportion previously worked is that the children, having already made the ratios and combined them to form a proportion, are better able to see how the statement is again constructed from the three terms given in the Rule of Three sum.

As in the method of unity, treat *direct* and *inverse* proportion separately.

15. Bills of Parcels.—These are better attacked after the Rule of Three has been taught, because a knowledge of this rule is often an aid in solving some of the items. When *mental arithmetic* is well taught Bills give no trouble.

Let your exercises be actual Bills, or at least such as would be rendered. The correct form of *making out* and *receiving* a Bill should be taught. Occasionally write a Bill on the black-board to be copied.

• DECIMALS.

16. Elementary Notions of the Decimal Notation.—Such a knowledge is required of the elder children of the Junior Division (Standard IV.). We will therefore assume in our teaching no knowledge beyond what they possess.

If notation has been thoroughly taught and illustrated in the way suggested, decimals should cause little trouble. In the first steps illustrations should be used.

(1) **Notation of Whole Numbers.**—Represent in the concrete 1, 1 1 1, and write on the black-board thus—

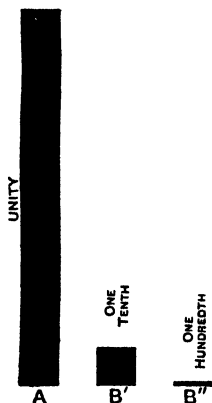
thousand.	hundred.	ten.	unit.
1	1	1	1

From the concrete illustration recall the fact that the value of each digit **increases ten-fold** as it is moved **one place to the left**.

Reverse the operation, and show that the value of each digit **decreases ten-fold** as it is moved **one place to the right**.

(2) **Notation of Decimals.**—Continue the same system *beyond the units*, and show that the value of the next 1 beyond the unit would not be one whole at all, but only a *part of a whole*, viz. $\frac{1}{10}$ of the tablet or stick.

Take 2 strips of paper, A and B, of the same length, each to represent the unit. Leave A unfolded; but divide B into 10 equal parts, and take one of these parts, B'. If A represents unity, then B' represents the value of the *first* 1 beyond unity.



Take another piece of B', and carefully divide it into 10 equal parts. Take one of these parts, B''. This represents the value of the second 1 from unity.

Concrete illustrations need not extend beyond this; the children are able to continue the series without such aid.

Now write the series—

thousand.	hundred.	ten.	unit	tenth.	hundredth.	thousandth.	o.
1	1	1	1	1	1	1	

When the lessons are given after vulgar fractions have been taught, the decimals may be expressed in the form of fractions,
 $1 \quad 1 \quad 1 \quad 1 \quad \frac{1}{10} \quad \frac{1}{100} \quad \frac{1}{1000}$.

The definition of a **decimal** fraction may now be given.

(3) **The Decimal Point.**—Show that if the heading were omitted, the position of the unit figure would not be known. Tell that the position of the unit is denoted by a dot called the **decimal point**, placed directly after it, to the right.

Write 36·52, and tell how it is read—

(a) 36 point 5/2.

(b) $36 \frac{52}{100}$.

(4) **Exercises.**—Give exercises in the following—

(a) Name the value of each digit in a written number, *e.g.* 73·064.

(b) Write any number dictated, *e.g.* 3 hundredths, 7 thousandths, &c.

Be sure to introduce and explain (from its use in the whole number) the *use of the cypher* in the decimal.

(5) **Decomposition:**

(a) Decompose a whole number, *e.g.*—

$$\begin{array}{rcl} 136 & = & 1 \text{ hundred, } 3 \text{ tens, } 6 \text{ units.} \\ = & & 13 \text{ tens, } 6 \text{ units.} \\ = & & 136 \text{ units.} \end{array}$$

(b) Lead on from this to the decomposition of decimals, *e.g.*—

$$\begin{array}{rcl} 3\cdot64 & = & 3 \text{ units, } 6 \text{ tenths, } 4 \text{ hundredths.} \\ = & & 36 \text{ tenths, } 4 \text{ hundredths.} \\ = & & 364 \text{ hundredths.} \end{array}$$

Give practice in the *reverse process*, e.g.—

74 thousandths = 7 hundredths, 4 thousandths.

When fractions have been learnt the decomposition may be expressed thus—

$$\begin{aligned} .874 &= \frac{8}{10} + \frac{7}{100} + \frac{4}{1000} \\ &= \frac{87}{100} + \frac{4}{1000} \\ &= \frac{874}{1000} \end{aligned}$$

(6) **Changing Decimal to Vulgar Fraction.**—After a number of similar examples, such as the above, deduce the **Rule**—

To change a decimal into a vulgar fraction write the digits of the decimal for the numerator, and for the denominator place 1, followed by as many cyphers as there are decimal figures.

17. Addition and Subtraction.—The arrangement of the sum is the only point which will need special attention.

Dictate a sum in whole numbers, and remind the children that the figures must be placed *under the proper denomination*. Show that the same is the case in decimals; and, therefore, when a sum is properly arranged, *the decimal points are under each other*.

In the early exercises the following heading will be useful—

H.	T.	U	.	th	ths	ten	thous
	2	4	.	5	6	0	0
			.	0	0	9	0
	9	0	.	5	0	9	4

Note also, that since cyphers to the *right* of a decimal are valueless, we may make the lines of uniform length *by supplying cyphers*. It is well to do this, especially in subtraction; cyphers added, will also be necessary in division.

When the numbers are expressed in *words*, the children will often have to supply cyphers to the *left* of the digit to give the figure its proper local value, e.g. nine thousandths in the above. The third line will also need care.

Compare line by line the actual *working* of the rule, with

the working of a sum in whole numbers—Each line is totalled separately; and the sum of the digits of this denomination is changed into the next higher denomination.

In subtraction the method of working is the same as in whole numbers.

18. Multiplication.—The position of the decimal point in the product will be the only difficulty presented. The rule may be established either by means of vulgar fractions, or by a process of simple reasoning.

(a) *By vulgar fractions*—

$$\begin{array}{r|l}
 74\cdot5 = 74\frac{5}{10} = \frac{745}{10} & \begin{array}{r} 74\cdot5 \\ \times 39 \\ \hline 6705 \\ 2235 \\ \hline 29055 \end{array} \\
 \cdot 39 = \frac{39}{100} & \\
 \hline
 \therefore 74\cdot5 \times 39 = \frac{745}{10} \times \frac{39}{100} = \frac{29055}{1000} = 29\cdot055.
 \end{array}$$

(b) *By simple reasoning.*—Treat the multiplier and the multiplicand as whole numbers. The product is then too great. 745 is 10 times greater than 74·5; therefore the product is 10 times too great, and must be divided by 10, *i.e.* one decimal place must be marked off from the right (2905·5).

The multiplier 39 is 100 times greater than 39; therefore the product 2905·5 is 100 times too great, and must be divided by 100, *i.e.* the decimal point must be moved *two* places to the left (29·055).

Hence the **Rule**—*Multiply as whole numbers; and from the right of the product mark off as many decimal places as there are decimal figures in the multiplier and multiplicand together.*

Prepare the children for cases in which *cyphers have to be added* on the left, in order to make the required number of decimal places, *e.g.* $73\cdot24 \times 00072 = 0527328$.

19. Division.—As in vulgar fractions (p. 263), prepare the children to recognize and understand that the quotient may sometimes be **greater** than the dividend. $\cdot 8 \div \cdot 4$ means how many times is $\cdot 4$ contained in $\cdot 8$? The answer 2, is greater than the dividend $\cdot 8$.

This rule^{*} generally gives much trouble, but when carefully explained, it is easily understood. Let the rule be taught in two stages—

(1) **Division by a Whole Number:**

(a) *Short division, e.g.* $555 \div 6$.

Here we shall experience the advantage of the full treatment given to the short division of whole numbers. Set out the sum in the concrete, and illustrate each step of the process—

$$\begin{array}{r} 6 \overline{) 555 \cdot 0} \\ \text{Ans.} \quad \underline{92 \cdot 5} \end{array}$$

Working—

1. 55 tens divided into 6 groups, gives 9 tens each and 1 ten remains.
2. Change 1 ten into 10 units. 10 units + 5 units = 15 units. 15 units divided into 6 groups, gives 2 units each, and 3 units remain. If these 3 units are to be divided into 6 groups, evidently each whole must be split into fractions. Hence the

Rule.—*When the units figure of the dividend has been divided, the integral (whole) part of the quotient ceases; and the decimal point must be placed to show this.*

Get this well grasped, and the chief difficulty is removed.

3. Place the decimal point in the quotient.
4. Change 3 units into 30 tenths. 30 tenths divided into 6 groups, gives 5 tenths each.

The quotient 92·5 is seen in its concrete form. When the first decimal place is reached, a cypher may be added to the dividend.

(b) *By factors.*—Work the above example by the factors 3×2 , and give other examples.

$$\begin{array}{r} 6 \left\{ \begin{array}{l} 3 \overline{) 555} \\ 2 \overline{) 185 \cdot 0} \end{array} \right. \\ \text{Ans.} \quad \underline{92 \cdot 5} \end{array}$$

(c) *By Long Division.*—Take an example which can be worked both by factors and by Long division, *e.g.*—

$$1. 473.28 \div 25. \quad 2. 49376 \div 32.$$

$$25 \left\{ \begin{array}{r} 5 \overline{) 473.280} \\ 5 \overline{) 94.6560} \\ \hline \text{Ans. } 18.9312 \end{array} \right.$$

$$25 \overline{) 473.2800} \quad (18.9312$$

25
223
200
232
225
78
75
30
25
50
50
...
=

End of the integers: therefore
dec. pt. placed in the quotient.

No more decimals: \therefore cyphers
added.

$$32 \left\{ \begin{array}{r} 8 \overline{) 49376} \\ 4 \overline{) 06172} \\ \hline \text{Ans. } 01543 \end{array} \right.$$

$$32 \overline{) 49376} \quad (01543$$

32
173
160
137
128
96
96
...
=

* No integers: \therefore dec. pt. at
once placed in the quotient.

† 4 tenths cannot be divided
into 32 groups, and give
tenths. A 0 is therefore
placed in the quotient.

(2) **Division by a Decimal.**—Give a few examples such as the following, to be worked mentally—

$$\begin{aligned} 8 \div 2 &= 4 \\ (8 \times 10) \div (2 \times 10) &= 80 \div 20 = 4 \\ (8 \times 100) \div (2 \times 100) &= 800 \div 200 = 4 \end{aligned}$$

From this the children see that *we may multiply divisor and dividend by the same number without altering the value of the quotient.*

Hence—

$$\begin{array}{l|l} (a) & (b) \\ 9.45 \div 4.5 & .351969 \div .0069 \\ = (9.45 \times 10) \div (4.5 \times 10) & = (.351969 \times 10000) \div (.0069 \times 10000) \\ = 94.5 \div 45 & = 3519.69 \div 69 \end{array}$$

Work plenty of other similar examples, and so lead the children to see—

1. That every division sum in which the divisor is wholly or partly a decimal, may, by multiplication, be changed into an equivalent form in which *the divisor is a whole number*.
2. That the multiplication is effected by moving the decimal point, both in dividend and divisor, as many places to the **right** as there are decimal places in the divisor.

If you make your children thoroughly master this step, there is nothing further in division of decimals which will cause trouble. We have now but to apply the rule for division by a whole number.

Deduce the **Rule**—*Make the divisor a whole number by removing the decimal point, both in divisor and dividend, as many places to the right as there are decimal places in the divisor. Perform the division, and place the decimal point in the quotient when the units figure has been divided.*

Carefully note the following sum—

$$\begin{aligned} 3. \quad & 150\cdot3 \div \cdot0006 \\ & = (150\cdot3 \times 10000) \div (\cdot0006 \times 10000) \\ & = 1503000 \div 6 \end{aligned}$$

Here we have been obliged to add three *significant cyphers* to the dividend in order to remove the decimal point the correct number of places.

20. Conversion of Vulgar Fractions to Decimals.

(1) **Non-recurring or Non-circulating Decimals.**—Question on the meaning of $\frac{7}{8}$, viz. $7 \div 8$.

Hence the **Rule**—*Divide the numerator by the denominator.*

(2) **Recurring or Circulating Decimals.**—Work out by means of (1) the value of the following fractions—

$$\begin{aligned} (a) \quad & \frac{2}{3} = \cdot6666 \dots\dots \\ & \frac{2}{9} = \cdot2222 \dots\dots \\ & \frac{4}{7} = \overline{\cdot571428} \quad \overline{571428} \quad \overline{571428} \dots\dots \\ (b) \quad & \frac{5}{6} = \cdot83333 \dots\dots \\ & \frac{147}{990} = \cdot\overline{148} \quad \overline{48} \quad \overline{48} \dots\dots \end{aligned}$$

Because some figures **repeat** or **recur** in the quotient, these decimals are called **repeating**, **recurring**, or **circulating** decimals.

When *all* the figures repeat, as in the examples (a), the decimal is called a **pure circulating decimal**; but when *only a part* of the figures repeat, as in the examples (b), the decimal is called a **mixed circulating decimal**.

Show the way in which these decimals are written—

$$(a) \quad \frac{2}{3} = \dot{.}6; \quad \frac{2}{9} = \dot{.}2; \quad \frac{4}{7} = \dot{.}571428.$$

$$(b) \quad \frac{5}{6} = .8\dot{3}; \quad \frac{147}{990} = .1\dot{4}8.$$

21. Conversion of a Circulating Decimal to a Vulgar Fraction.—The reason for the rule is easily understood.

(1) **Pure Circulating Decimal**, *e.g.* Express $\dot{.}2$ as a vulgar fraction.

$$(a) \quad \text{Since } \dot{.}2 = .2222 \dots\dots$$

$$(b) \text{ then 10 times } \dot{.}2 = 2.2222$$

$$\therefore \text{ Subtracting (a) from (b), } 9 \text{ times } \dot{.}2 = 2$$

$$\dot{.}2 = \frac{2}{9}$$

Hence the **Rule**—Take the figures of the pure circulating decimal for the numerator, and for the denominator write as many 9s as there are circulating figures.

(2) **Mixed Circulating Decimal**, *e.g.* Express $.8\dot{3}$ as a vulgar fraction.

$$\text{Since } .8\dot{3} = .8333 \dots\dots$$

$$(a) \text{ then 100 times } .8\dot{3} = 83.3333 \dots\dots$$

$$(b) \text{ and } 10 \text{ times } .8\dot{3} = 8.3333 \dots\dots$$

$$\therefore \text{ Subtracting (b) from (a), } 90 \text{ times } .8\dot{3} = 75$$

$$\therefore .8\dot{3} = \frac{75}{90} \left[= \frac{83-8}{90} \right]$$

Hence the **Rule**—For the numerator write the digits of the decimal, and from this number subtract the number represented by the figures which do not recur. For the denominator write as many 9s as there are recurring digits, and to the right of these place as many cyphers as there are non-recurring digits.

The Metric system, which is a decimal system, requires a knowledge of the elements of mensuration in order to be thoroughly understood. Its consideration will, therefore, come better after the paragraph on elementary mensuration.

22. Simple Interest.—To find the simple interest on a given principal. Take a familiar example to make plain the meaning of the terms used, *e.g.*—

“A man wants to buy some houses, but he has not enough money by £100. A friend offers to lend him the required amount, if, at the end of the year, he will pay back the £100 together with £4 for having the use of it.

So that altogether he pays back £104.

This £100 = **Principal** = money lent.

„ £4 = **Interest** = money paid for the use of money lent.

„ £104 = **Amount** = the principal together with its interest.

If the man wished to keep the money more than 1 year, he would pay £4 for each year he used the money.

Interest is always reckoned at so much for every £100 lent for 1 year, *i.e.* at so much **per cent** (*centum* = 100) **per annum** (*annus* = year).

The amount charged for every £100 is called the **rate per cent**.

In the above example the interest is at the *rate of 4 per cent per annum*.”

Give other illustrations, and the children will understand the terms used.

We can now teach the rule *in stages* by means of *mental exercises*.

First Step. Interest on a given principal at a given rate for 1 year:

(a) *Mental.* For every £100 at 4 p. c. the interest = £4.

∴ on £200 at 4 p.c. the interest = $2 \times 4 = £8$ $\left[\begin{array}{l} \text{No. of hundreds} \\ = \frac{200}{100} = 2. \end{array} \right]$

∴ on £50 „ „ = $\frac{1}{2} \times 4 = £2$ $\left[\begin{array}{l} \text{No. of hundreds} \\ = \frac{50}{100} = \frac{1}{2}. \end{array} \right]$

(b) *Written.* Show the two methods of working, e.g. S. I. on £250 for 3 yrs. at $2\frac{1}{4}$ p. c.—

First Method.

$$\begin{aligned} \text{Interest} &= \frac{\text{Principal}}{100} \times \text{Rate} \times \\ &\quad \text{No. of years.} \\ &= \frac{250}{100} \times \frac{9}{4} \times 3 \\ &= \frac{135}{8} \\ &= \underline{\underline{£16, 17s. 6d.}} \end{aligned}$$

Second Method.

$$\begin{array}{r} \begin{array}{r} \text{£} \quad \text{s} \quad \text{d.} \\ 250 \quad 0 \quad 0 = \text{Principal.} \\ \quad \quad \quad 2\frac{1}{4} = \text{rate p. c.} \\ \hline 500 \quad 0 \quad 0 \\ 62 \quad 10 \quad 0 \\ \hline 562 \quad 10 \quad 0 \\ \quad \quad \quad 3 = \text{years.} \\ \hline 100 \overline{) 16.87 \quad 10 \quad 0} \\ \underline{20} \\ 17.50 \\ \underline{12} \\ 6.0 \end{array} \quad \text{Ans. } \underline{\underline{£16, 17s. 6d.}} \end{array}$$

The children's attention should be called to the following points:—

(1) Months and days must be expressed as a fraction of a year.

(2) In calculating the days *between two dates*, e.g. August 14 to December 12, *omit* the *first* date but include the latter.

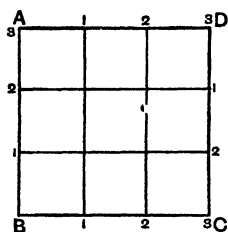
(3) Since the Interest = $\frac{\text{Principal}}{100} \times \text{Rate} \times \text{Time}$, the process is often much simplified by first multiplying rate and time together.

MENSURATION OF RECTANGULAR SOLIDS.

23. This subject, when treated experimentally, is very interesting. The children have now reached an intelligent age, and are able to grasp steps in the reasoning far more easily; hence many hints will not be needed.

The Table of Square Measure.—Build up experimentally. Take a piece of brown paper, each side measuring a yard. Examine the angles; each is a right angle: therefore the figure is a rectangle; and since each side measures 1 yd., this rectangle is a square yard. The extent of its surface is called the **area**: therefore the area of the rectangle is 1 square yard.

On each side mark the foot divisions. Join opposite points by **red** lines, and note the result—9 divisions are formed.



Measure all the sides of any one of these divisions, and note that each measures 1 ft.: therefore each division is a **square foot**.

The side AD = breadth = 3 lineal feet.

„ AB = length = 3
and $AB \times AD = \text{length} \times \text{breadth} = 3 \text{ ft.} \times 3 \text{ ft.} = 9 \text{ sq. ft.} = \text{Area.}$

Truths taught—

(1) Lineal feet of length \times lineal feet of breadth gives **square** feet in **area**.

(2) 1 square yard = 9 sq. feet.

Next take a foot-rule, and divide each lineal foot in the length and breadth into 12 inches. Join opposite points by **blue** lines, and note the result—each square foot is divided into a number of divisions, each of which, when tested, is seen to be a **square inch**; and in each square foot there are **144** sq. inches.

$\therefore 144 \text{ sq. inches} = 1 \text{ sq. foot.}$

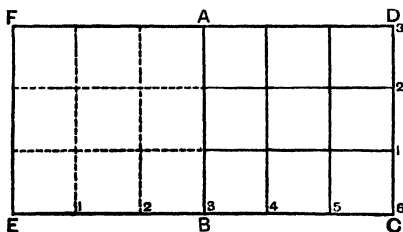
Calculate the number of square inches in a sq. yard from—

(1) 36" in the side of the lineal yard. $36 \times 36 = 1296 \text{ sq. inches.}$

(2) The number of square inches in 1 sq. ft. $144 \times 9 = 1296 \text{ sq. inches.}$

The children now see how square measure is constructed from lineal measure. The remainder of the table may be formed in the same way.

24. To find the area of any Rectangle.



Take a sq. yd., ABCD.

Put another sq. yd., FEBA, beside it—FECD is a rectangle, but not a square.

Area of ABCD = 9 sq. ft.

„ FEBA = 9

$\therefore \text{Area of } FECD = 2 \times 9 = 18 \text{ sq. ft.}$

But the length EC

$\times \text{breadth } CD = 6 \times 3 = 18 \text{ sq. ft.}$

Draw lines to show this.

∴ The area of any rectangle = length \times breadth
= square (ft.).

25. Given the area and one other term, to find the third term of a Rectangle.

If length \times breadth = area

- then breadth = area \div length = $\frac{18}{3} = 3$ ft. (*lineal*)
- „ length = area \div breadth = $\frac{18}{3} = 6$ ft. (*lineal*).

Note.—The length and the breadth must be expressed in terms of the same denomination—yards, feet, or inches. If not so expressed, they must first be reduced to the same denomination.

Exercises.—To keep up the interest and fix what has been taught, let the children calculate, from actual measurements made by themselves, the area, length, or breadth of a book, slate, desk, black-board, table, floor, wall, &c.

Combine these with questions as to the cost of covering the floor with carpet at so much per square yard, painting the ceiling at so much per square foot, &c. Let the prices given be fairly correct, and the information thus gained will be valuable to the children.

26. Perimeter.—See there is no confusion made between the *perimeter* and the *area*. The perimeter is the distance round a space, and is expressed in *lineal* feet.

Thus the perimeter of the rectangle FECD
= 6 + 3 + 6 + 3 feet
= 2 (length + breadth).

Give calculations requiring the use of the perimeter, e.g. cost of framing pictures with moulding at per foot.

27. Carpeting Rooms.—These are questions arising out of the preceding work. We have to find the number of yards of carpet or paper required of a certain width; or given the number of yards to find the width required.

The whole surface has to be covered.

Therefore, the area of the carpet = area of the room.

∴ The length \times breadth of the carpet = area of the room.

∴ The length of carpet = area of the room \div breadth
of the carpet;

or The breadth of carpet = area of the room \div length
of the carpet.

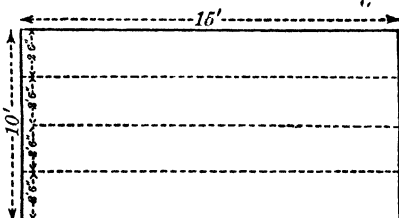
Example.—What length of carpet 2 ft. 6 ins. wide is needed to carpet a room 5 yards long and 10 ft. wide?

Here, the **area** of the room = 5 yds. \times 10 ft. = 15' ft. \times 10 ft.
= 150 sq. feet.

\therefore the **length** of carpet = $150 \div 2$ ft. 6 ins. = $150 \div 2\frac{1}{2}$
feet = 60 feet.

Ans. = 20 yds.

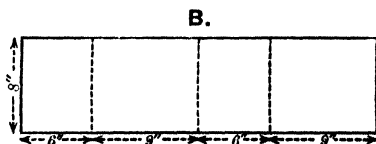
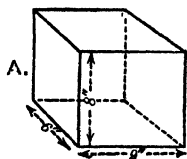
Work out a diagram to show the truth of this.



Since the room is 10 ft. wide, 4 strips each 2 ft. 6 ins., placed side by side, will cover the width. But each of these strips must be 15 ft. long.

\therefore Length of carpet
= $15 \times 4 = 60$ ft.
= 20 yds.

28. Papering Walls of a Room.—The area to be covered is the area of the four walls; but there is an easier way than finding each of these separately. Take a cardboard box, A, to represent the room; say 9" in length, 6" in breadth, and 8" high. *Cut out the bottom*; then the sides only are left; and these represent the four walls to be papered. Cut down one corner, and open out flat as at B.



From this the children at once see that the four walls form a rectangle whose

(a) **length** = $9'' + 9'' + 6'' + 6'' = 2 (9'' + 6'')$
= 2 (length of the room + breadth of the room).

(b) **breadth** = $8'' =$ height of the room;
and therefore the **area of the 4 walls** = 2 (length of room + breadth of room) \times height of room.

The *length of paper required* is now found exactly in the same way as we found the length of carpet required (par. 26), the area of the four walls being used instead of the area of the room.

$$\therefore \text{Length of paper required} = \frac{\text{Area of 4 walls}}{\text{width of paper}}$$

Give plenty of practical questions on papering, painting, glazing, &c.

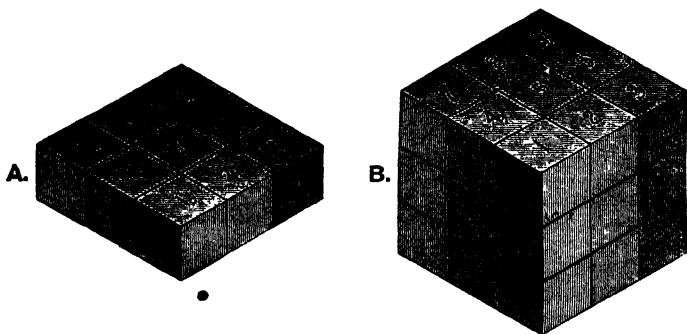
29. Rectangular Solids.—Examine the cube used in model drawing. Notice that it has 6 faces; that each face is a square; that all the faces are equal, and opposite faces are parallel.

From a comparison of a square rectangle of paper of the same size as one face of the cube, with the cube itself, draw out the new dimension—**thickness**.

Supply the children with the small cubes of Gift III. Let the children examine and measure them—the height, length, and breadth, each equal 1 inch. The cube is exactly a **cubic inch**; and its **volume**, therefore, is a cubic inch.

The **cubic foot** has exactly the same properties.

Cubic Yard.—Let each cube of Gift III. represent a cubic foot. Form a square surface (A) with them, using 3 cubes in



the length and 3 in the breadth. Carefully note that to make this surface the children require $3 \times 3 = 9$ cubes, *i.e.* length \times breadth = cubic contents.

On this surface build a second, and then a third (B).

Let the children now measure the length, 'breadth, and height of B; each will be found to be 3 ft. We have, therefore, a cube; and since it is 3 ft. or 1 yard in all its dimensions, this cube is a **cubic yard**.

But this cubic yard was made up of three equal layers of cubes, each containing 9 cubes of a cubic ft.; and since there are 3 of these layers in the cubic yard, there must be $3 \times 9 = 27$ cubic feet in a cubic yard.

The cubic contents of *one layer* = $3 \times 3 = \text{length} \times \text{breadth}$.

„ „ the cubic yd. = $3 \times 3 \times 3 = \text{length} \times \text{breadth} \times \text{height}$.

Therefore the cubic contents of a rectangular solid = length \times breadth \times height.

Let the children now calculate, *from actual measurements made by themselves*, the cubic contents of boxes, cupboards, &c.

If the cubic feet of stone in a cistern, tank, &c., with a specified thickness be required, the cubic contents = the capacity from the outside measurements – the capacity from the inside measurements.

To find the third dimension, given the volume and the other two.

Since the length \times breadth \times height = cubic contents,

the length = $\frac{\text{cubic contents}}{\text{breadth} \times \text{height}}$,

the breadth = $\frac{\text{cubic contents}}{\text{length} \times \text{height}}$,

the height = $\frac{\text{cubic contents}}{\text{length} \times \text{breadth}}$.

THE METRIC SYSTEM.

30. For a full explanation of the Metric System and its advantages, the teacher will consult a good arithmetic book. We here propose simply to give a few hints as to the way in which the subject may be taught.

We strongly advise teachers at first to **keep to the units**, and then to proceed to the *sub-multiples* to teach the principles of the system, leaving the *special names* used until the former is thoroughly mastered.

Get the units well fixed by accustoming the children to pay for goods in **francs**; to buy cloth by the **metre**; to estimate roughly the size of room, playground, &c., in **square metres**; to talk of the capacity of a cupboard, &c., in **cubic metres**; to buy litres of milk, and **grammes** of butter.

Units of Weights and Measures.—The connection of each of these units with the other should be shown and illustrated.

The Franc.—Show one. Tell its value (about $9\frac{1}{2}d.$). Pay for things in francs. Show how value is expressed, *e.g.* 56f.

The Metre.—This word means simply “measure”. Show the metre, and compare it with the yard. Get the lengths of different articles in the room told by actual measurement with the metre. (Do not notice its subdivision.) Visit, in imagination, shops where things can be purchased by the metre; and let children tell roughly how many metres of cloth would be needed for a dress, &c. Show how length is written, *e.g.* 15 m.

The Square Metre.—This is a square, each side of which measures a metre. Draw it on the black-board. Calculate the area of the room, the wall, the playground, &c., in square metres. Show how these are expressed, *e.g.* 56 sq. m.

The Cubic Metre.—Show a box roughly a metre in length, breadth, and height. Calculate the cubic contents of different things. Show how these are written, *e.g.* 146 cub. m.

The Litre.—Get a tin box roughly $\frac{1}{10}$ of a metre in length, breadth, and height. Pour $1\frac{3}{4}$ pints of water into it, and note that it is filled. Go to shops where purchases can be made in litres; buy beer, milk, oil, &c. Calculate roughly the capacity of the gallon, &c., in litres. Show how quantities are written, *e.g.* 8 l.

The Gramme or Gram.—Draw a line $\frac{1}{100}$ of a metre in length. If we had a cubic tin box each of whose sides was this length, and filled it with distilled water, this water would weigh as much as this little weight (show the *gramme*). Children see how small it is. Tell that for ordinary purposes we use a weight a thousand times as heavy (the *kilogramme*). Show this weight, and put it on the scales with $2\frac{1}{2}$ lbs. on other side (*kilogramme* = $2\frac{1}{2}$ lbs.). Go to the grocers, butchers, &c., and make purchases. Show how each weight is written, *e.g.* 36 g.; 7 kg.

31. Sub-multiples.—The children by this time have become accustomed to the names of the chief weights and measures, and are ready to learn the smaller measures, and how they are expressed; to make calculations, and to observe the facility with which these are made.

Call to mind the decimal terms, and rewrite the heading formerly used; write over each of these the Latin word.

Next write the names of the units, and from these form the names of sub-multiples. The children are to give the value of each as it is written,

	1 decimetre = $\frac{1}{10}$ of a metre.		
	deci-	centi-	milli-
U.	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
metre	deci-metre	centi-metre	milli-metre.
litre	deci-litre	centi-litre	milli-litre.
gramme	deci-gramme	centi-gramme	milli-gramme.

(1) **Length:**

(a) Take the decomposition of each, .

$$\begin{aligned} \text{e.g. } 1 \text{ metre} &= 10 \text{ decimetres.} \\ &= 100 \text{ centimetres.} \\ &= 1000 \text{ millimetres.} \end{aligned}$$

(b) Now write on the black-board units and decimals of the unit, and get the value told thus—

U.	deci.	centi	milli.	
43	5	6	3	= 43 m. 5 decimetres 6 centimetres 3 millimetres.
				= 43 m. 56 centimetres 3 millimetres.
				= 43 m. 563 millimetres.

(c) After this write from dictation certain lengths expressed in different terms, as the decimal of a metre, e.g. 4 metres 5 decimetres 7 centimetres 9 millimetres = 4.579 metres.

(d) Another useful exercise is to reduce terms to other denominations, e.g.—

$$\begin{aligned} 43 \text{ m.} &= 430 \text{ decimetres} \\ &= 4300 \text{ centimetres} \\ &= 43000 \text{ millimetres.} \end{aligned}$$

Compare with the reduction of yards to inches and thus show the saving of labour. Reverse the process to show the facility with which **ascending** reduction is performed.

Go through similar exercises with the litre and gramme.
We can now treat the sub-multiples of Area and Volume.

(2) **Area:**

U.	dec.	centi.	milli.
sq. metre.	sq. decimetre.	sq. centimetre	sq. millimetre.
•	10×10	10×10	10×10
	= 100	= 100	= 100

Take the sides of the square metre, and divide each into 10 decimetres. Join the opposite points. Then **1 sq. metre** is seen to equal **100 sq. decimetres**.

Work exercises similar to those in the other units, *e.g.*—

- (a) **1 sq. metre** = 100 sq. d.m.
 = 10,000 sq. c.m.
 = 1,000,000 sq. m.m.

- (b) $5 \cdot 34 \overset{\text{dec.}}{28} \overset{\text{centi.}}{73}$ **sq. metres**
 = 5 sq. m., 34 sq. d.m., 28 sq. c.m., 73 sq. m.m.

The children must carefully note that *two* figures of the decimal must go to each denomination, because **100** of the sub-multiple is required to make the next denomination above.

- (c) Express as sq. metres and decimals of a sq. m. quantities given in different denominations, *e.g.* 36 sq. m., 5 sq. d.m., 13 sq. c.m., 7 sq. mm.

$$= 36 \cdot 05 \overset{.}{13} \overset{.}{07} \text{ sq. m.}$$

The reason for the cyphers is apparent from (b).

- (d) **43 sq. m.** = 4300 sq. d.m.
 = 43 $\overline{00 \ 00}$ sq. c.m.
 = 43 $\overline{00 \ 00 \ 00}$ sq. m.m.

(3) **Volume:**

U.	dec.	centi.	milli.
cub. m.	cub. d.m.	cub. c.m.	cub. m.m.
•	$10 \times 10 \times 10$	$10 \times 10 \times 10$	$10 \times 10 \times 10$
	= 1000	= 1000	= 1000

The diagram given on p. 295 shows each side of the cube divided into decimetres, proving that a cub. metre = 1000 cub. d.m.

Work similar exercises to those in *area*, e.g.—

$$\begin{aligned} (a) \text{ cub. m.} &= 1,000 & \text{cub. d.m.} \\ &= 1,000,000 & \text{cub. c.m.} \\ &= 1,000,000,000 & \text{cub. m.m.} \end{aligned}$$

u. deci. centi. milli.

$$\begin{aligned} (b) \text{ } 5 \cdot \overline{346} \overline{284} \overline{371} \text{ cub. metres} \\ = 5 \text{ cub. m., } 346 \text{ cub. d.m., } 284 \text{ cub. c.m., } 371 \text{ cub. m.m.} \end{aligned}$$

Note.—3 figures are taken for each denomination, because 1000 of a sub-multiple is required to make 1 of the next higher denomination.

$$\begin{aligned} (c) \text{ } 43 \text{ cub. m., } 17 \text{ cub. d.m., } 284 \text{ cub. c.m., } 9 \text{ cub. m.m.} \\ = 43 \cdot 017 \overline{284} \overline{009} \text{ cub. m.} \end{aligned}$$

$$\begin{aligned} (d) \text{ } 43 \text{ cub. m.} &= 43 \overline{000} \text{ cub. d.m.} \\ &= 43 \overline{000} \overline{000} \text{ cub. c.m.} \\ &= 43 \overline{000} \overline{000} \overline{000} \text{ cub. m.m.} \end{aligned}$$

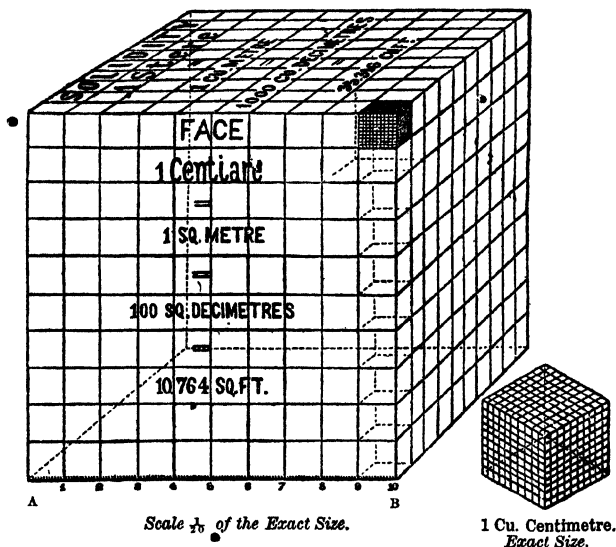
Money.—Teach that the **franc** = 100 centimes.

32. Multiples.—These may next be taught in an exactly similar way. Pay special attention to the **kilometre**, used for great lengths, e.g. roads, railways; the **hectolitre**, used for wholesale transactions; and the **kilogramme**.

33. Special Terms.—When the above *principles* of the system have been thoroughly grasped the special names used may be taught with advantage. The following diagram will be useful to the teacher. It shows how the are, stere, litre, and gram are related to the metre. A B represents a **metre**. It is divided into decimetres and centimetres. The **are** is a square with a base of 10 metres; so the face of the cube is the $\frac{1}{100}$ part of an are, or 1 centiare. The whole cube represents a **stere**, or cubic metre, which is the unit of cubic measure. The little cube at the top represents a **litre**, or cubic decimetre, the unit of capacity. A **gram**, the unit of weight, is too small to show to scale, being derived from a cube whose edge measures one of those minute divisions in A B; so we show one by itself.

34. Higher Rules.—Children after working through the

course in the way we have sketched, should be able to grasp percentages, stock, &c., with ease. Any good arithmetical



text-book will supply the teacher with suitable examples and hints.

GOVERNMENT QUESTIONS.

1. Suppose you had to give a first lesson in fractional arithmetic, what visible illustrations would it be well to use? Show also what sort of easy *mental* exercises ought to precede a formal lesson on the subject.

2. Give a short set of graduated mental exercises suitable for an introductory lesson on "Reduction of Fractions to a Common Denominator". State precisely how much you assume the children to know already, and explain shortly your method and aim.

3. State and explain, as to a class, the rule for the multiplication of a whole number by a fraction.

4. Explain any way you know of making clear to the eye the process called multiplying $\frac{2}{3}$ by $\frac{1}{4}$.

5. Explain, as to a class of scholars, the rule for "cancelling" in either fractions or proportion, and give some examples.

6. Make and explain diagrams to illustrate the following:—

$$(a) \frac{1}{2} \left(\frac{1}{2} - \frac{1}{4} \right) = \frac{1}{8}; \quad (b) \left(\frac{1}{2} - \frac{1}{4} \right) \div \frac{1}{8} = \frac{1}{2}.$$

7. Describe any apparatus that you have employed, or seen in use, for enabling learners to verify by sight the addition table, cubic measure, and subtraction of fractions.

8. Show how you would explain to a class of beginners the reason of any one of the following processes in arithmetic:—(a) Ascending reduction; (b) Subtraction of fractions; (c) Division by factors.

9. Make four sums, two in direct and two in inverse proportion, and show how you would explain to a class the working of one of them.

10. What do you understand by a decimal system of weights and measures? Write the tables of money, length, and capacity in this system.

11. Make four sums such as would be properly suited to test the proficiency of a scholar in the Fifth Standard.

12. Write at full length an example in Compound Practice which will prove your process in this instance to be shorter than the ordinary method of compound multiplication.

13. Write full notes of a lesson on "The Rule of Three" by the method of unity.

14. Give the heads of a lesson on "Ratio and Proportion".

CHAPTER XV.—GRAMMAR.

I. Why we Teach it.—"The general object of lessons in English should be to exercise the thinking powers, to enlarge the learner's vocabulary, and to make him familiar with the meaning, the structure, the grammatical and logical relations, and the right use of words. Elementary exercises of this kind have an important practical bearing on everything else which a child learns." (*Instructions to H. M. Inspectors.*)

One Inspector speaks of grammar, when properly taught, as "the Euclid of the elementary school"; it is the one subject of school instruction requiring abstract thought; and it was, probably, on account of the mental training which the subject, when judiciously treated, is able to afford, that for many years grammar was the compulsory class subject in elementary schools.

The study of grammar teaches children to think clearly and connectedly: for often the truth to be demonstrated is established only after a succession of advances, each depending on that which precedes.

This is pre-eminently the subject of elementary school instruction in which the reasoning faculty is developed, and the judgment exercised.

Dr. Fitch¹ says: "It is not as a set of rules for enabling English people to speak correctly that English grammar has the least value. This is the popular conception of grammar, and it is a very erroneous one. . . . Some of the best and purest speakers of the language have either never learned grammar, or are not in any way consciously guided to correct speech by a knowledge of grammatical rules. They have learned to use their own language *by using it*, by imitation and habit." (*Lectures on Teaching*.)

But though this is undoubtedly true, yet the teaching of grammar does possess practical value, for it shows children *why* a certain form, for example, is correct or incorrect, and provides the child with a test which he may apply in cases of doubt: it teaches the exact meaning and uses of words, and shows *how* they must be combined to form sentences; it impresses what is correct in speech or writing, and helps to eradicate the incorrect.

2. General Method of Teaching.—On the method of teaching adopted depends entirely the value of the subject. Grammar is not to be regarded as a number of arbitrary rules to be committed to memory and then applied: the truths which grammar teaches are to be found in the language itself; and it is in the discovery of these rules for themselves, under the teacher's guidance, and in their subsequent application to other examples, that the intellectual value of the exercise consists.

Clearly, then, the teacher is but a guide: he leads children to examine sentences illustrating some one grammatical truth; by judicious questioning this truth is recognized by the children; their grasp of it is shown by the formation of other sentences illustrating the same truth; the truth discovered is expressed by the children in their own words, and, with the teacher's help, is stated concisely in the form of a rule or definition; its correctness is then tested by applying it to other examples. The rules and definitions of grammar must, therefore, be *taught inductively, and applied deductively*.

"From the first, the teaching of the English language should be supplemented by simple exercises in composition: *e.g.* when a word is defined, the scholar should be called on to use it in a sentence of his own; when a grammatical principle is explained, he should be asked to frame a sentence showing how it is to be applied. . . . Mere instruction in the termin-

ology of grammar, unless followed up by practical exercises in the choice and use of language, cannot be expected to yield very satisfactory results." (*Instructions to H.M.I.*)

3. Schemes of Work.—In addition to the course of work set out in Schedule II., there are no less than four alternative courses, A, B, C, and D, as well as a special course for "small schools", and another course for schools taking object lessons as a class subject in the lower part of the school.

Course A is based on the analysis of sentences. Course B is distinguished by oral composition replacing formal grammatical knowledge in the two lowest standards. Course D "has for its main object the avoidance of all technical terms in the lowest two standards at least, but the same avoidance may be readily carried forward with a little ingenuity in the third and fourth standards".

With the exceptions noted above in Courses A and B, the work is, with slight variations, of much the same character in all the courses, viz. pointing out the parts of speech in the lower division, and parsing and analysis, together with word-building, in the upper division.

In the highest class of all, Courses A and C require paraphrasing; Course B, précis writing and exercises in the right use of commercial terms; Course D, shortened and idiomatic sentences historically explained.

4. The Starting-point.—"To a child a sentence is easier than a word: the cognition of a word is easier than that of a syllable as a separate entity; and the syllable itself is somewhat easier than the power or significance of a single letter. And hence the way to teach English grammar is to *begin with the sentence*, because that is something known, and to proceed *analytically*." (*Lectures on Teaching*.)

With this dictum, Mr. Fearon, formerly one of H. M. Inspectors, agrees. In his work on "School Inspection" he says: "What is wanted is to get as quickly as possible a notion of the structure of the sentence, and of the logical relation of its parts. And for this purpose the teaching of English grammar should be begun, and based throughout its course, on the analysis of sentences."

Experience gained in teaching on these lines shows that the attention of children is more easily secured, because they are

from the commencement interested in what they are called on to do; as soon as they begin to construct sentences they feel they are doing something of practical use. This in itself is an incentive to exertion.

Cultivate the power of oral expression, extend the children's vocabulary, and lead them to recognize the value of words, by requiring answers in complete sentences to questions proposed, or complete statements with respect to objects placed before the children.

The sentence thus formed is the unit of language. By contrast we may then lead the children to recognize the functions of the words composing it, and to see that each word in the sentence has its own special work to do.

Whether we choose to teach grammar by commencing with the parts of speech or with analysis, the **sentence** is, in either case, the best basis for the lessons.

5. Dangers to be Avoided.—In lessons on this subject there are certain errors into which young teachers are prone to fall; it may be well, therefore, at the very outset, to briefly indicate a few of the more important, so that such teachers may be on their guard.

(1) **The Confusion between Words and Things.**—Not infrequently one hears the young teacher ask his pupils to show him a noun. When the child holds up a slate, book, &c., this is accepted by the teacher. Here there is confusion between the *thing* and its *name*: the *noun* is the *word* "slate"; not the object itself.

Grammar deals with *words*, not with the things for which the words stand.

(2) **Teaching the Definition First.**—A definition is based on a generalization of particular truths; it is evident, therefore, that the child should first be made acquainted with the truths themselves before he is presented with any generalized statement with respect to them.

However easy a definition may appear, it must not be forgotten that "a generalization is simple only in comparison with the whole mass of particular truths it comprehends; that it is more complex than any one of these truths taken singly; that only after many of these single truths have been acquired, does the generalization ease the memory and help the reason;

and that to a mind not possessing these single truths it is necessarily a mystery" (*Herbert Spencer*).

The young teacher often errs in the character of his definition; that which is suitable for an adult is not equally serviceable for very young children. In teaching grammar, especially in the early stages, strictly logical definitions are not essential. A statement which embraces the leading characteristics of the group of words, is often far more serviceable in developing the intelligence of the children.

(3) **Mechanical Aids.**—Occasionally, to overcome difficulties which the subject presents, the young teacher is tempted to give the children mechanical ways of testing, for example, what part of speech a word is, the case of a noun, &c. Such a course not only defeats the object of the lessons, but leads to the discomfiture of the pupils. A child allowed to use these mechanical tests, in parsing a sentence such as the following, "He is a likely person to succeed me", would say—

Likely—An adverb(?), because it ends in "-ly".

Person—Nominative case(?) to the verb "succeeds" which follows it.

(4) **Omitting to State the Reason for the Answer.**—If grammar is to be taught for the mental training it affords, it is most essential that the teacher should make the exercise a real intellectual one by requiring the *reason* for every answer given. Unless this be done, the work too often becomes a mechanical exercise, involving little or no thought, as is shown when the children very glibly give the *person* and *number* of the verb, and are then unable to state the subject.

(5) **Too Much Help Given by the Teacher.**—The young teacher likes to see his pupils making rapid advance. To secure this he gives, perhaps quite unconsciously, such help that no real mental effort on the child's part is necessary. *E.g.* a child is called on to analyse the sentence—

My stockings there I often knit.

Such a teacher will say—

"What is the Subject?" "Who knits?" The child merely supplies the answer "I".

"What is the Predicate?" "What did I do?" The child supplies the answer "Knit".

"What is the Object?" "I knit what?" The child answers "Stockings".

This involves little mental effort on the child's part; and where such aids are more or less habitually given to backward children, it is no wonder they fail when these crutches are removed.

(6) **The Use of Terms which are not Understood.**—Too frequently children use terms such as “limiting”, “qualifying”, “modifying”, &c., without understanding what they imply. It is better to restrict the use of these terms to the elder children, who should be able to thoroughly grasp their meaning.

In the sentence—These children write well—it is quite sufficient for a young child to say—

“*These*”—An adjective, pointing out “children”.

“*Well*”—An adverb, telling how the children “write”.

6. The Sentence.—Some time should be spent at the outset in bringing home to children the use of words as the means of expressing thought. Objects should be placed before them, and they should be asked to make some statement with respect to each.

One or more of these statements should be written on the black-board, and, side by side with it, the teacher should write the same words in a different order, *e.g.*—

A.

B.

(a) The bell rings loudly.

(a) Rings the loudly bell.

(b) The book has pretty pictures.

(b) Pictures the pretty has book.

The children at once see that although the words used in each are exactly the same, yet the one group makes sense whilst the other does not. In this way we may lead to the inductions—

1. Words must be arranged in a certain order so that they may make sense.

2. A group of words making sense is called a sentence.

The children may now be asked to make sentences about certain things, or to answer questions in sentences. Time spent in this preliminary work will be well repaid.

7. From the following brief sketch it will be seen that by teaching the noun and verb at the same time through sentences, the contrast between the function of the two words is brought out, and children are led from the commencement to see that each word has its own work to do in the sentence.

OUTLINE OF A LESSON ON SUBJECT and PREDICATE; or NOUN and VERB.

TRUTHS TAUGHT AND METHOD OF TEACHING.

I. The Sentences formed.

The teacher shows different articles, *e.g.* knives, pens, doors, &c., and asks the children to state what the different things can do.

The sentences thus formed are written on the black-board.

II. The Sentences examined.

(a) The teacher again points to the articles, *e.g.* the knives, and asks "What are these?" He then gets the children to examine them and tell of what they are made.

Pointing to the word "knives" in the first sentence, he asks, "Am I pointing to the knives?" (No.) "What am I pointing to, then?" (*The name of the thing.*) "What forms the name?" (*A word.*)

Treat each of the other sentences in the same way.

Induction.—Some words tell the **names of things** spoken about.

(b) "I have written nothing opposite 'knives'. What do I not know?" (*What the knives do.*) "If I place the word 'cut' there, what does this word tell?" (*What the knives do.*)

Treat each of the others in the same way.

Induction.—Some words tell **what things** do.

Separate as shown.

III. Parts of the Sentence named.

(1) If teaching *analysis*, the teacher now tells—

(a) The word which tells the name of the thing spoken of, is called the **Subject** of the sentence.

(b) The word which tells what the thing does, is called the **Predicate** of the sentence.

(2) If teaching the *parts of speech* the teacher tells—

(a) All *name* words are called **Nouns**.

(b) All *doing* words are called **Verbs**.

BLACK-BEARD ILLUSTRATIONS.

Knives cut.
Pens write.
Doors open.

Words telling Names of things.

Knives.
Pens.
Doors.

Words telling Names of things.

Knives
Pens
Doors

Words telling What things do.

cut.
write.
open.

(1) Subject. Predicate.

Knives	cut.
Pens	write.
Doors	open.

(2) Nouns. Verbs.

Knives	cut.
Pens	write.
Doors	open.

TRUTHS TAUGHT AND METHOD OF TEACHING.

IV. Exercises.

(a) Write on the black-board Subjects (or nouns), and require the children to supply suitable Predicates (or verbs).

(b) Reverse the process, requiring subjects to be supplied.

BLACK-BOARD ILLUSTRATIONS.

(a) Subject. (Nouns.)	Predicate. (Verbs.)
Birds
Dogs
(b) Subject. (Nouns.)	Predicate. (Verbs.)
.....	swim.
.....	jump.

8. Enlargement of Subject—The Adjective.—We have only to write on the black-board some such sentence as—Boys steal—to show the necessity of other words in the sentence. This sentence implies that all boys steal, whereas what we wish to say is—*Wicked* boys steal. This word added is neither a *name* word nor a *doing* word; hence the children see the necessity of a new class of words usually joined to the subject, by which the subject is enlarged.

The term **enlargement** need present no difficulty, for the children are familiar with it when applied to a house; a room *added* is called an *enlargement* of the house.

Each kind of adjective might well form the subject of a *separate* lesson; but we will give a brief outline of a lesson on the adjective generally, as an aid to the young teacher in drawing up “Notes of a Lesson” on a “Part of Speech”. In all these lessons, to save space, we omit *time, class, &c.*

OUTLINE OF A LESSON ON THE ADJECTIVE.

TRUTHS TAUGHT AND METHOD OF TEACHING.

I. Words telling What sort of things.

Write these sentences on the B.B. Have the noun and verb pointed out. By questioning show that what is stated is not true; e.g. Iron does not burn unless it is made *hot*. Invite children to prefix words which will make the statements true.

Examine the words added, and note—

- (1) Each is joined to the noun.
- (2) Each tells *what sort of thing.*

BLACK-BOARD ILLUSTRATIONS.

..... boys steal.
 iron burns.
 girls fail.
Wicked boys steal.
Hot iron burns.
Lazy girls fail.

TRUTHS TAUGHT AND METHOD OF TEACHING.

II. Words telling How many things.

Treat these sentences in the same way; e.g. remind children that the ostrich does not fly, and so show necessity for some such word as "most".

When suitable words have been suggested, examine those added, and note—

(1) Each is joined to the noun.

(2) Each tells *how many things*.

III. Words which Point out things.

Place a new and an old book before the children, and get them to state in a sentence which is the new one and which the old. Give similar exercises dealing with other things.

Examine the new class of words, and note—

(1) Each is joined to the noun.

(2) Each is used to *point out things*.

IV. The Definition.

From the black-board examples the children can now state—

1. The new class of words tells something more about things.

Call attention to the *position* of the words with respect to the noun, and tell that the word *adjective* = joined to; and that because these words usually occupy this position they are called *adjectives*. Help them to form the definition.

2. *Adjectives are words which tell what sort of things, how many things, or point out things.*

V. Exercises.

Give sentences such as those in (a), and require the children to point out the adjectives, giving the reason for each answer.

In (b) the children are to supply suitable adjectives.

BLACK-BOARD ILLUSTRATIONS.

(Many)

..... men succeed.

(Most)

..... birds fly.

(Nine)

..... boys were late.

This book is new.

That book is old.

These children cry.

Those children laugh.

(a) *These* early boys will go.

Some beautiful birds were seen.

(b) The wind doth blow.

..... plants died.

Pronouns in the possessive case may be treated under the third division.

9. **The Complement of the Predicate.**—Now the children are acquainted with these three classes of words, they are prepared to deal with sentences such as the following:—

(a) Boys are idle.

(b) John is a butcher.

Children taught on either plan will be able to separate each of these sentences into—

- (1) Subject or name of thing spoken about;
- (2) Predicate or telling part.

On examining the predicate the children find there is no word which expresses **doing**; but that “are, idle”, taken together, tells *what the boys are*; “is a butcher”, taken together, tells *what John is*. These words together *state or assert* something about John. •

If I say (a) Boys are —, (b) John is —, the sentence is not complete until I add the word “idle” or “butcher”. This word *completes* the predicate, and is therefore called the **Complement of the Predicate**.

Looking at the words “are idle”, “is a butcher”, the children see “idle” is an *adjective* telling what sort of boys, and “butcher” is a name word. These words are linked on to the name of the thing spoken about by the little words “are” and “is”. “Are” and “is” help to make the assertion, and are called “link-verbs”. Sentences containing such verbs, *e.g. am, are, is, was, were, seem, become, &c.*, should now be given, and the children accustomed to recognize the adjective and the noun *in its new position*.

10. The Extension of the Predicate—The Adverb.
—Make the children feel the necessity for the new class of words.

John’s mother wants him particularly, and she sends to the school to say so. The reply comes back—John will come. But being very anxious, she is not satisfied. What more does she want to know? Plainly, **when** he will come. Let the children supply a suitable word, *e.g.*—

John will come *immediately*.

“ “ “ *now*.

“ “ “ *presently*.

• In the same way show the necessity for words telling **where** or **how** an action is done.

The children will now recognize they are dealing with a class of words performing a *new* function.

If we divide these sentences into subject and predicate (whether we use these terms or not is immaterial, if we are

teaching the parts of speech), we shall find that these new words are added to the predicate or verb to tell something more about the action.

In teaching the part of speech we have but to remind the children that *ad* means *to*, in order to introduce the new term—**Ad-verb**.

If teaching analysis it is not difficult to make the children understand the new term—*Extension*.

Remind them that when a shopkeeper is enlarging his shop by adding another part to it, he puts up a notice—

“Important Alterations.
Extension of Premises.”

That part which is added is called the **Extension**. So when we enlarge the predicate by adding words to tell something more about it, the words added are called the **Extension of the Predicate**, or, for shortness, the **Extension**. Such extensions make important alterations in the meaning of the sentence.

Plenty of exercise should be given—

- (1) In selecting adverbs from sentences given;
- (2) In introducing suitable adverbs into sentences; *e.g.*—
 - (a) The boys wrote and
 - (b) We will proceed

The adverb of **degree** must not be overlooked. Its function will be observed from such sentences as the following—

- (a) The man walks *very* quickly.
- (b) The wind is *very* rough.

Its function is to show the *degree* in which a thing or action possesses a particular quality.

II. The Object—The Pronoun.—The pronouns in the nominative case might well have been taught after the noun and verb. We have placed the pronoun here in connection with the object, because this arrangement allows the use of both nominative and objective forms of the pronoun.

Even if our purpose be to teach only the parts of speech, the introduction of sentences containing an object will accustom the children—

- (1) To distinguish two classes of verbs;
- (2) To recognize the noun in a new position in the sentence.

If I write[•] on the black-board—

- (1) The boy laughed,
- (2) The boy broke,
The boy took,

the first sentence is felt to be complete; but in the other two something is seen to be wanting in order to complete the sense.

- Allow the children to supply what is wanting; *e.g.*—

The boy broke *the stick*.
The boy took *the book*.

In each of the sentences in (2) we have a subject and predicate (noun and verb); yet the sentence is not complete till we add a word telling **what** the boy broke; **what** the boy took.

Since in each case the subject (noun) is the same, the difference must be in the *predicate* (verb). “Laughed” is an action which affects only the *doer* of the action—boy; but “broke” and “took” each denote an action which not only concerns the doer of the action, but the effect of which passes over to an object. This thing is called the object of the action, and the *name* of the thing forms the **Object of the Sentence**.

“Stick” and “book”, therefore, each forms the object of a sentence.

The children learning the parts of speech will notice that the sense is completed by the addition of a **noun**.

We may at this stage teach the names of the two classes of verbs, **transitive** and **intransitive**, or content ourselves with having shown that there are two classes, leaving the technical terms to be supplied at a later stage.

A few sentences such as the following will be easily corrected by the children, and lead them to recognize the presence of a new class of words.

- (1) John struck Mary (and) (2) Mary struck John.

This will be changed to—

- (1) John struck Mary (and) (2) *she* struck *him*.

The children[•] at once see that *she* has been used for Mary, and *him* for John.

Give sentences introducing other pronouns. Examine these sentences, and so find out that the *function* of the new class of words is to replace or stand *for* nouns. Tell that *pro* means *for*, and that therefore the words performing this function are called **Pro-nouns**.

Give sentences requiring the subject or object to be filled, or replaced by, a pronoun, *e.g.* (He) called John.
John called (him).

12. The Prepositional Phrase—The Preposition.—

We now arrive at a very important stage, when the necessity arises for showing children that a *group of words* may together perform the function of one word, *i.e.* that a **phrase** may replace a part of speech.

Whether we are teaching the parts of speech or analysis, a good knowledge of the function and structure of the phrase is equally important, if the work is to be thoroughly successful and intelligently done.

Write on the black-board the *first* of each of the following pairs of sentences—

- (1) (a) { The *courageous* act was rewarded.
The act *of courage* was rewarded.
(b) { A *strong* man is wanted.
A man *of strength* is wanted.
(c) { A *tearful* scene followed.
A scene *of tears* followed.

Let the children examine the words in italics, and state that each is an **Adjective** (or enlargement of the subject). Ask them to replace each of these words by two or more words expressing the same idea. In this way obtain the *second* sentence in each pair. Underline the words which replace the adjective.

Here, then, we have two words doing the same work as the adjective in the first sentence of each pair.

Write on the black-board the *first* of each of the following pairs of sentences—

- (2) (a) { I will come *immediately*.
I will come *at this moment*.
(b) { John stands *here*.
John stands *on this spot*.
(c) { We watched her *carefully*.
We watched her *with care*.

The children, on examining the word in italics in the first of each pair of sentences, will discover that the word is an **Adverb** (or an extension of the predicate).

Ask them to replace this one word by two or more words conveying the same idea. Write down the second sentence of each pair. Draw a line under the group of words which do the same work as the adverb.

Here, then, we have groups of words doing the work of adverbs.

These groups of words, taken by themselves, do not make sense; hence they cannot be called sentences.

Tell that a *group of words which does the work of one part of speech and does not form a sentence is called a phrase.*

Let the children point out each of the phrases in the above sentences, and tell *why* it is a phrase.

Examine the structure of these phrases—

- | | |
|----------------------|--------------------------|
| (a) man of strength. | (b) come at this moment. |
| scene of tears. | stands on this spot. |

If in the sentences in (a) we omitted the little word “of” we should not know what connection or relation there was between the thing called “strength” and the thing called “man”, or between “tears” and “scene”. This little word, then, shows the relation which exists between two things.

If in (b) we omitted “at” we should not know what relation existed between the *action* (coming) and the *thing* (moment). In the same way “on” shows the relation of the action (standing) to the thing (spot).

These two words, then, *show the relation between an action and a thing.*

Notice that these words showing relation are usually *placed before* the name of the thing related. Tell that the word **preposition** means *placed before*, and that, therefore, *words showing the relation between things, or between an action and a thing, are called Prepositions.*

In each of these phrases we shall therefore find (1) a noun or its equivalent, (2) a preposition. Note also that the noun may have words attached to it to do the work of an adjective.

We strongly urge the importance of children being taught to distinguish the phrase, and to recognize its adjectival or adverbial function.

13. The Infinitive Phrase—Verb Infinitive.—This is a very difficult part of the course of work, yet one which must be understood if intelligent work is to be done either in

parsing or analysis. We may proceed to explain the subject in some such way as the following.

Write on the B.B.—To walk is pleasant.

To swim is useful.

To read is interesting.

What is pleasant?—To walk. What is useful?—To swim. What is interesting?—To read.

“To walk”, “to swim”, “to read”, each form the *subject* of a sentence (or take the place of the *name* of the thing spoken of).

If we examine these subjects, we shall find they are words denoting *action*. Hitherto such words have been used to form the *predicate* (or to denote some action done by the thing spoken of).

But a little thought shows us that these words, “to walk”, “to swim”, “to read”, are here *used in a different way to what we have been accustomed to use them*.

In “I walk”, “I swim”, “I read”, the action is done *by one particular person*—I; but “to walk”, “to swim”, “to read”, in the sentences we are considering, are *simple statements of an action in a general way*, without limiting it to a particular person or thing as the doer of the action.

When the action is spoken of, or limited to, a particular person or thing, as “I walk”, the verb is called a **Finite verb**; when, however, the verb simply expresses action in a general way, that is, without limiting the action to any particular person or thing as the doer, this verb is called the **verb Infinite**.

The part of the verb infinite we are now considering, is usually preceded by *to*. We have seen that it may take the place, and do the work of, a noun in the sentence.

We may now recall to the children’s minds that some verbs do not themselves complete the sense, but in order to do this they require a name or its equivalent placed after them (v. 11, p. 307). This is true also of the verb infinite.

To break.....is laborious,

is not complete until I add the name of *what* is broken, *e.g.*—

To break *stones* is laborious.

“Stones”, therefore, forms the object of the *verb* “to break”, though not the object of the *sentence*.

Again, verbs may have adverbs and prepositional phrases used adverbially added to them; so may the verb infinite, *e.g.*—

To break stones *long* is laborious.

To break stones *for some time* is laborious.

What is laborious?—*To break stones for some time.*

• Here we have a group of words taking the place of the noun; this group of words, therefore, since by itself it does not make sense, forms a phrase; and since the words of this phrase depend on the verb infinite, this phrase is called an Infinitive phrase.

When the structure of the infinitive phrase used as the *subject* of a sentence has been well mastered, the children may be taught to recognize its use.

(a) As the *object* of the sentence, *e.g.* I hoped to sell my beautiful house.

(b) „ *extension* „ *e.g.* He came to see his old home.

The other uses of the infinitive phrase may be taken at a later period. It should be as simple for the children to recognize an infinitive phrase as to recognize the noun or adverb whose function it performs. Abundant practice should be given until this can be readily and accurately done. When the phrase is recognized, the children know the parts of speech to be found in it.

14. **The Participial Phrase—The Participle.**—The simplest uses of the participle and participial phrase, since they enter so largely into the structure of the sentence, may be taught here. This is probably the most difficult part of grammar for young children. We may proceed somewhat as follows.

Write on the black-board—

(a) A rolling stone gathers no moss.

The children examine the sentence and note that “rolling”—

(1) Is a word denoting *action*, *i.e.* it is a *verb*.

(2) Is a word telling *what sort of* stone, *i.e.* it does the work of an *adjective*.

Now write—

(b) The man *rolling* the tub is the porter.

Which man is the porter?—The one “rolling the tub”.

“Rolling the tub”, therefore, points out the man spoken of; that is, these words do the work of an adjective.

Note that “tub” is the object of “rolling”, which is the distinguishing word.

I may say—

The boy *rolling* is my son.

Here, as in the first sentence, “rolling”—

(1) Is a word denoting action, *i.e.* it is a *verb*.

(2) Is a word doing the work of an *adjective*.

That “rolling” does the work of a *verb*, is shown by its taking an object after it. This word, therefore, *shares* the functions of two parts of speech—the verb and the adjective. We call such words **Participles** (L. *particeps* = sharing).

Since participles are verbs, they may not only take an object, but have an adverb or its equivalent added to them, *e.g.*—

(c) The man *rolling the tub along so quickly*, is the porter.

Which man is the porter?—The one “rolling the tub along so quickly”.

Here we have a group of words doing the work of one part of speech, but which, by itself, does not make sense; these words, therefore, form a *phrase*; and since they all depend on the participle, such a phrase is called a **Participial phrase**.

The teacher may now take up the other forms of the participle, *e.g.*—

(d) The boots *rolled* in paper belong to me.

(e) The house *built* on the hill is conspicuous.

(f) The man *blown* from the ladder was killed.

What we want the children to recognize is that *the function of the phrase is the same as the function of the simple part of speech with which they are already familiar, and that the same tests will enable them to discover the function of either word or phrase.*

15. The Conjunction.—We may with advantage at this stage, if not earlier, teach the conjunction in so far as its function is to join words, phrases, and simple sentences together; so that children may be able to tell all the parts of speech in a simple sentence.

NOTES OF A LESSON ON THE CONJUNCTION.

TRUTHS TAUGHT AND METHOD OF TEACHING.

I. How Words are joined.

1. Write on the B.B. sentences 1 (a) and (b). • The children will discover that the *same action* is done by each, and that there are *two doers* of the action. Let them suggest a shorter and better way of saying the same thing. Write (c).

Note that now the two *name words* are joined by *and*.

2. Write sentences 2 (a) and (b). Note that the *doer* of the action is the same in each, but that there are *two actions*. Let children suggest a shorter way. Write (c). Now get a form suggested if Mary is to do only *one* of the actions at the particular time. Write (d).

Note that the *two words expressing action* are joined by *and* and *or*.

3. Write on the B.B. 3 (a) and (b). Let children suggest a better form. Write (c). Note that the two words expressing *what sort* of books are joined by *and*.

Induction.—Some words are used to join together **words** of the same kind.

II. How Phrases are joined.

1. Write on the B.B. 1 (a) and (b). Note that "into the house", "into the yard", are phrases telling *where* John ran. As before, get children to supply a better form (c); then a form which would do if John went into only *one* of these places (d).

Note that the *two phrases telling where* are joined by *and* and *or*.

2. Write 2 (a) and (b). What is difficult?

(1) Working sums.

(2) Writing good copies.

Show that each of these are phrases doing the work of a noun. The children are to suggest better forms (c) and (d).

Note that *two phrases used as nouns* are joined by *and* and *or*.

Induction.—Some words are used to join together **phrases** of the same kind.

BLACK-BOARD ILLUSTRATIONS.

I.

1. (a) John went home.
(b) Mary went home.
(c) John **and** Mary went home.

2. (a) Mary sings.
(b) Mary plays.
(c) Mary **sings and** plays.
(d) Mary **sings or** plays.

3. (a) The book is large.
(b) The book is cheap.
(c) The book is **large and** cheap.

II.

1. (a) John ran into the house.
(b) John ran into the yard.
(c) John ran into the house **and** into the yard.
(d) John ran into the house **or** into the yard.
2. (a) Working sums is difficult.
(b) Writing good copies is difficult.
(c) Working sums **and** writing good copies are difficult.
(d) Working sums **or** writing good copies is difficult.

TRUTHS TAUGHT AND METHOD OF TEACHING.

III. How Sentences are joined.

1. Write sentences 1 (a) and (b). Note no part of these sentences is common. Write (c). Children tell sentences are joined by *but*.

2. Treat 2 (a) (b) (c) in the same way.

Induction.—Some words are used to join sentences together.

IV. The Definition.

Examine the words underlined: the work of each is to *join together*. Tell that the word **conjunction** means "joining together". Lead children to formulate the definition—

A conjunction is a word used to join together words, phrases, or sentences.

V. Exercises.

Write suitable sentences on the B B. Let children distinguish the conjunctions, and tell what they join.

BLACK-BOARD ILLUSTRATIONS.

III.

1. (a) The man came.
(b) My mother did not see him.
(c) The man came, *but* my mother did not see him.
2. (a) I spoke loudly.
(b) He did not hear.
(c) I spoke loudly, *yet* he did not hear.

IV.

Joining words, and, or, but, yet, &c.

Conjunctions—

and, joining *John* and *Mary* (words).
or, „ *into the house* or *into the yard* (phrases).
yet, „ *I spoke loudly* yet *he did not hear* (sentences).

16. The Function of Words Varies.—From the first, the teacher must impress upon the children that *the function of the word determines the part of speech* the word is. A girl may be a chamber-maid in one situation, but in the next the same girl may serve as parlour-maid. The name by which she is called depends upon *the work she does* in the house.

The same is true of words. In different sentences they may perform totally different functions, and, therefore, be called by different names, that is, be different parts of speech.

A few sentences carefully chosen will make this clear to the children, *e.g.*—

- (1) I came by the *last* train.
- (2) These boots *last* well.
- (3) He stood *last*.
- (4) Boots are made on a *last*.

In (1)	"last"	tells <i>which</i> train;	so it is an adjective.
„ (2)	„	what the boots <i>do</i> ;	„ a verb.
„ (3)	„	<i>where</i> he stood;	„ an adverb.
„ (4)	„	the <i>name</i> of a thing;	„ a noun.

As soon as children have mastered the noun and verb, exercises should be given to show that the same word may be a *noun* in one sentence, and a *verb* in another. This will prevent children attempting to tell what part of speech a word is from its form, appearance, or from its position in the sentence. If mechanical work take the place of intelligent thought, it is fatal to progress.

Children should also be asked to frame sentences using a word as a given part of speech; this is a more difficult test, but one which will repay time spent on it.

17. Classification.—Grammar deals largely with classification. In our first lessons we begin to classify *words* according to their functions; later in the study we classify the *inflections* which words undergo, as well as their *syntactical relations*. Sentences, like words, are also classified according to their function.

When classifying we must set before us *one leading idea* upon which to base our classification, otherwise we shall find the same word may belong to more than one class.

If we classify the books of a library according to the *material used in the binding* of the book, our classification will be complete; each book will belong to one class only, *e.g.* the calf, morocco, paper, &c., class.

If we classify the books according to the *colour of the binding*, this classification will also be complete; each book will belong to one class only, *e.g.* the red, blue, green, &c., class.

But if we attempt at the same time to classify them both with regard to the material used *and* the colour of the binding, this will not do; for we may find that of two books bound in *calf*, one may be in *brown* and the other in *blue*: both should go into one class, because the material used is the same; but because the colours are different the two should be in different classes.

In classifying, therefore, there should be a class for everything, but each thing should be capable of belonging to only one class.

We will illustrate what we have said by—

A LESSON ON

THE CLASSIFICATION OF NOUNS.

Knowledge assumed.—Ability to recognize nouns.

TRUTHS TAUGHT AND METHOD OF TEACHING.	BLACK-BOARD ILLUSTRATIONS.
I. Nouns contrasted.	
<p>1. Send Henry behind the black-board. In the pocket of another boy place a knife. Call Henry and say "A boy has the knife". Write on black-board. Show that though Henry knows from the word "boy" that he must seek for the knife on a boy and not a girl, yet he does <i>not</i> know <i>which</i> boy has it, for the name "boy" is applicable to all the male children; it is a name given to <i>each</i> in the class.</p>	<p>1. { (a) A boy has the knife. (b) Jones has the knife.</p>
<p>Now say, and write "Jones has the knife". Henry can find the knife at once now, for "Jones" is the name which only <i>one</i> boy out of the class bears.</p>	
<p>Give other examples, and lead to the</p>	
<p><i>Inductions.</i>—A. Some nouns are names given to <i>each person</i> out of a class of the same kind.</p>	<p>(a) The girl is late. (b) Mary Smith is late.</p>
<p>B. Some nouns are names of <i>particular persons</i> to point them out from the class to which the person belongs.</p>	
<p>2. Write 2 (a) on the black-board, and show by the same kind of teaching that "town" is the name of <i>each</i> thing out of a class. Write (b) and show that this applied to a <i>particular</i> place.</p>	<p>2. { (a) I live in a town. (b) I live in Leeds.</p>
<p>Give other examples, and so lead to the</p>	
<p><i>Inductions.</i>—A. Some nouns are the names given to <i>each place</i>, &c.</p>	<p>(a) The continent is large. (b) America is large.</p>
<p>B. Some nouns are the names of <i>particular places</i>, &c.</p>	
<p>3. In the same way lead to the</p>	
<p><i>Inductions.</i>—A. Some nouns are the names given to <i>each thing</i>, &c.</p>	<p>3. { (a) The ship is old. (b) The Victory is old.</p>
<p>B. Some nouns are the names of <i>particular things</i>, &c.</p>	<p>(a) The cathedral is large. (b) St. Paul's is large.</p>

TRUTHS TAUGHT AND METHOD OF
TEACHING.

Examine the sentences 1, 2, and 3; arrange on the black-board, and lead children to the

General Inductions—

Nouns are names given to

A. *Each* person, place, or thing out of a class of the same kind.

B. A *particular* person, place, or thing to point it out from the class.

II. Terms applied.

Lead children to see that *particular* names belong to the person, place, or thing *alone*; that it is *one's own*. Tell that there is a Latin word (*proprius*) which means *one's own*. Hence these names are called **Proper** nouns. Help children to form the definition—

A **Proper Noun** is the name given to a *particular* person, place, or thing to point it out from the class to which it belongs.

The other names are *common* to, or shared by, each member of the class; hence these names are called **Common** nouns. Lead to the definition—

A **Common Noun** is the name given to each person, place, or thing out of a class of the same kind.

Arrange on the black-board.

III. Exercises.

(a) Write on the black-board some proper nouns, and let the children supply the corresponding common noun; and *vice versa*.

(b) Let children select and classify the nouns in a given passage.

BLACK-BOARD ILLUSTRATIONS.

Nouns are names of—

(a) or (b)

Each one of a class.	A particular one of a class.
boy.	Jones.
girl.	Mary Smith.
town.	Leeds.
continent.	America.
ship.	Victory.
cathedral.	St. Paul's.

Nouns are

(a) or (b)

Common.	Proper.
boy.	Jones.
girl.	Mary Smith.
town.	Leeds.
continent.	America.
ship.	Victory.
cathedral.	St. Paul's.

Common.	Proper.
(a)	Windsor.
....	Thames.
(b) man.
village.

Nouns may also be classified as **Concrete** and **Abstract**. If we take as our leading principle of classification *the manner in which things exist*, then we divide nouns into concrete and abstract; but when the principle adopted is *the extent of their application*, then nouns must be divided into common and proper.

To say that there are three kinds of nouns—common, proper, and abstract, is to attempt to classify nouns at the same time upon *both* the bases we have mentioned. Clearly a noun must be either the name of *one* thing, or the name of *more than one* thing. This classification is exhaustive.

18. Inflexion.—The changes which words undergo in order to express different shades of meaning form an interesting part of the study of grammar, and may now be taken in hand, since the children are able to distinguish the different functions of words composing the sentence.

Some inflexions are easier than others, *e.g.* the *number* of nouns and pre-nouns may be taught to, and readily understood by, young children. A child's daily experience teaches it when it uses the word "dog" that it is speaking of *one* thing only, and that when it is speaking of *more than one* thing it uses the word *dogs*.

The child sees at once that the word has been slightly *bent* out of its original form in order to show this change of meaning. *These bendings or slight alterations of form, made in order to denote a change of meaning, are called inflections, and the word so bent or changed is said to be inflected.*

To show how such lessons may be given, we proceed to give an outline of—

A FIRST LESSON ON

CASE (of Pronouns).

TRUTHS TAUGHT AND METHOD OF TEACHING.	BLACK-BEARD ILLUSTRATIONS.		
I. Two Forms of Words used.	I.		
1. Write on the black-board the sentences in 1 (a).	1. (a) John struck James and William.		
Children point out the nouns, and replace them by the proper pronouns (b).	James and William struck John.		
The children now see that "he" and "him" refer to the same person—John; and "they" and "them" to the same persons—James and William.	(b) <i>He</i> struck <i>them</i> . <i>They</i> struck <i>him</i> .		
2. Analyse these sentences.	2. Subj.	Pred.	Obj.
3. Since "he" and "him" refer to the same person, change their position in the sentences (a).	He They	struck struck	them. him.
In the same way replace "they" and "them" (b).	3. <i>Him</i> (a) <i>They</i>	struck struck	them. <i>he</i> .
Elicit from the children that the sentences in (a) and (b) offend the ear, and are incorrect. Hence the <i>induction</i> —	(b) <i>He</i> <i>Them</i>	struck struck	<i>they</i> . him.
There is one form of the pronoun for use as the <i>Subject</i> , and another form for use as the <i>Object</i> .	Subj. form. he. they.	Obj. form. him. them.	

TRUTHS TAUGHT AND METHOD OF TEACHING.

4. Analyse other sentences, and note the forms used in subject and object.

5. Show that "you" and "it" have the same form for subject and object. Tell that this was not always so.

II. Definition of Case.

Select examples to show that the object-form has been made from the subject-form by a slight change in the latter. Show that from the present form of the words this is not always apparent. Remind children that such changes are called *inflections*, and assist them to form the definition—

Case is an inflexion of pronouns to show their relation to other words in the sentence.

III. The Terms used.

Lead children to see that the form used in the *object* is appropriately called the *Object-ive Case*, and since the *subject* is the *naming-part*, we call the form used in the subject the *Naming Case* or *Nominative Case* (L. *nomen* = name).

Children arrange pronouns as shown.

IV. Exercises.

Write sentences on the black-board, and let the children select the pronouns and tell their case.

BLACK-BOARD ILLUSTRATIONS.

4. Subj.	Pred.	Obj.
(a) I	love	her.
She	loves	me.
(b) We	followed	him.
He	followed	us.
5. Subj.	Pred.	Obj.
You	fetches	it.
It	hurt	you.

II.

he.	they.
him.	them.

III.

Nominative Case.	Objective Case.
he.	him.
they.	them.
she.	her.
we.	us.
I.	me.
you.	you.
it.	it.

It will be noticed that many points have been omitted here, e.g. all mention of the **Possessive Case**, the objective case after the *preposition*, &c. What we have taught is ample for a *first* lesson.

A second lesson on inflexion—The Comparison of Adjectives—will be found on p. 34. This lesson illustrates another method of drawing up notes on a grammatical subject.

19. Hints on Parsing.—We are afraid the young teacher too often regards the parsing lesson as a means of *teaching* grammar, and that parsing sometimes usurps the place of the special lessons such as we have indicated, on the *principles* of grammar. If this be the case, difficulties will beset the child's path at every step, mechanical tests will be resorted to, and a strong dislike for the subject will be engendered.

The parsing exercise is a *test* whether the work taught has been understood, and whether children can *apply* what they have learnt. The knowledge gained is revised, refreshed, and deepened by these lessons, and the teacher is able to supplement previous teaching.

Since the exercise is but a test, the teacher must take care that the sentence chosen contains no point which has not been fully dealt with in previous lessons.

Having selected a suitable passage—

(1) *Arrange the words in the order of prose, e.g.—*

“The morning feast with joy they brought”
becomes “They brought the morning feast with joy”.

(2) *Either analyse the sentence fully or, at least, mark the subject and object.*

The reader will probably have gathered from the preceding pages that we strongly advocate the teaching of parsing and analysis side by side from the commencement. It is useless to attempt to parse a sentence unless subject and object, at least, can be distinguished.

The analysis may be thus indicated—

S.	P	En.	O.	Ext.
<div style="display: flex; justify-content: space-around; align-items: center;"> { { </div>				
They brought the morning feast with joy.				

(3) *Find out what work the word does in the sentence.*—It may assist you in this, if you—

(a) Think what parts of speech go with other parts of speech.

(b) What parts of speech are found in each part of the sentence.

(4) *The reason for the answer should always accompany it.*—This takes a little longer, but the answer is then a distinct help to *backward* children. Unless the reason is given, such children are no wiser at the end of the lesson than at the beginning.

We now give a complete Parsing Scheme, which young teachers may find of service in their teaching. A scheme such as this, in a form suitable for placing before the class, may occasionally be referred to by the children with advantage until considerable facility in parsing is acquired.

PARSING SCHEME •

NOUN—

- | | | | |
|-------------------|---|-------------------|------------------------------|
| 1. Kind. | { 1. Common or Proper.
or 2. Concrete or Abstract. | 2. Number. | { 1. Singular.
2. Plural. |
| 3. Gender. | { 1. Masculine.
2. Feminine. | 3. Common. | 4. Neuter. |
-
- | | | |
|---|---|---|
| 4. Case. | { | 1. Nominative Case subject to the verb —. |
| | | 2. " " after the copulative verb — |
| | | 3. " " in apposition with —. |
| | | 4. " " of address. |
| | | 5. " " Absolute. |
| | { | 1. Objective Case governed by the trans. verb —. |
| | | 2. " " " " " — (Factitive Obj.). |
| | | 3. " " " " " — (Indirect Obj.). |
| | | 4. " " " " " preposition —. |
| | | 5. " " Adverbial Object of —. |
| 6. " " in apposition with —. | | |
| Possessive Case limiting the noun —. | | |

PRONOUN—

- | | | | |
|-------------------|---|-----------------------|--------------------------|
| 1. Kind. | { 1. Personal.
2. Relative.
3. Interrogative. | 4. Indefinite. | 5. Demonstrative. |
| 2. Person. | 3. Number. | 4. Gender. | 5. Case. |

ADJECTIVE—

- | | | |
|-------------------|---|--|
| 1. Kind. | { | 1. Quality qualifying the noun —. |
| | | 2. Quantity limiting the noun —. |
| | | 3. Demonstrative pointing out the noun —. |
| 2. Degree. | { | 1. Positive.
2. Comparative.
3. Superlative. |

VERB—

- | | | | | | |
|--------------------------|---|--------------------------------|------------------------|---|-------------|
| 1. Kind. | { | 1. Transitive or Intransitive. | 2. Voice. | { | 1. Active. |
| | | 2. Principal or Auxiliary. | | | 2. Passive. |
| • 3. Conjugation. | | { | 1. Strong.
2. Weak. | | |

- | | | | | | | |
|-----------------|---|-----------------|------------------|-----|-------------|--------------------------|
| 4. Mood. | { | 1. Indicative. | 5. Tense. | { | indefinite. | |
| | | 2. Imperative. | | | Present | imperfect. |
| | | 3. Subjunctive. | | | | perfect. |
| | | 4. Infinitive. | | | Past | perfect and progressive. |
| | | Future | do. | do. | do. | |

6. **Person and Number** agreeing with its nominative —.

ADVERB—

1. **Kind.** { Time, Place, Manner, Cause modifying the verb —.
 Degree modifying the adjective or adverb —.
2. **Degree.** { 1. Positive.
 2. Comparative.
 3. Superlative.

PREPOSITION, joining — and —, and showing the relation between them; and governing —.

CONJUNCTION, Co-ordinate or Subordinate joining — and —.

20. The Complex Sentence.—If the child has an intelligent knowledge of the structure of the simple sentence, the complex sentence should present little difficulty.

So that the children may not be hampered with new terms when studying the different *kinds* of subordinate sentences, it would be well to give an introductory lesson explanatory of the terms, *Clause* and *Complex*. This we proceed to do.

OUTLINE OF A FIRST LESSON ON
THE COMPLEX SENTENCE.

TRUTHS TAUGHT AND METHOD OF TEACHING.	BLACK-BOARD ILLUSTRATIONS.
I. The New Element introduced.	I.
1. Teacher writes sentence 1 (a) on the B.B. The children suggest substitutes for the <i>Adjective</i> . (b) and (c) are then written.	1. (a) The <i>drowning</i> man is my brother. (b) The man <i>in the water</i> is my brother. (c) The man <i>who is in the water</i> is my brother.
2. Treat this part in the same way, obtaining substitutes for the <i>Adverb</i> .	2. (a) Visit me <i>here</i> . (b) Visit me <i>in this place</i> . (c) Visit me <i>where I am now staying</i> .
3. Obtain from the children, and write, the substitutes for the <i>Noun</i> .	3. (a) <i>Industry</i> brings its own reward. (b) <i>Being industrious</i> brings its own reward. (c) <i>That a man is industrious</i> brings its own reward.
4. Collect and arrange the examples in three columns. The children tell that (a) contains words and (b) contains phrases. Note that in (c), (1) each group contains a subject and predicate of its own; therefore it is not a <i>phrase</i> .	4. (a) (b) (c) Words. Phrases. drowning in the water. who is in the water. here. in this place. where I am now staying. industry. being industrious. that a man is industrious.

(2) By itself the group cannot make sense; therefore it is not a *sentence*.

TRUTHS TAUGHT AND METHOD OF TEACHING.

II. The New Terms taught.

1. Show that though in the form of a sentence each group is "*shut off*" to do a particular work in the sentence; therefore it is called a **Clause**.

2. Note sentences (c) in 1, 2, and 3. The whole sentence is like two sentences *folded together*; hence **Complex** sentence.

3. Help children to form definitions—

A Clause is a part of a sentence containing a subject and predicate of its own, but incapable of standing alone.

A Complex Sentence is one which contains one or more clauses.

III. Exercises.

1. Give sentences in which words or phrases are to be expanded into clauses.

2. Write complex sentences, and let children point out the clauses.

BLACK-BOARD ILLUSTRATIONS.

II.

1. L. *clausa* = shut.

Clauses.

(a) who is in the water.

(b) where I am now staying.

(c) that a man is industrious.

L. *con* = together; *plie* = fold.

III.

1. A *bad* boy is not happy.

2. He laughed *when I spoke*.

21. Adjectival Clauses—The Relative Pronoun.—

Having taught what a complex sentence is, we may now go more fully into the function of clauses and their relation to the principal sentence. We have always found it preferable to start with the adjectival clause, as being the simplest of the three. This introduces us to the remaining part of speech to be dealt with—the Relative Pronoun.

The twofold function of this part of speech (1) as a substitute for a noun, (2) as a connective word, will be readily perceived and understood in connection with the study of adjectival clauses. The difference between the relative pronoun and the conjunction should be noted.

In teaching the different kind of clauses, the teacher must impress upon the children that the *kind* depends entirely upon the *function* of the clause in the sentence; and that, although the words *introducing* the clause may prove an aid, no reliance must be placed upon them as *the* test of the kind of clause, since *the same word may introduce different clauses, e.g.—*

(1) I learnt *where he lives* (Noun clause).

(2) I saw the place *where he lives* (Adjectival clause).

(3) I live *where he lives* (Adverbial clause).

Illustrative sentences such as these will do much to impress upon the children's minds that *function* is the only reliable test of the kind of clause.

As an aid to the young teacher giving lessons on kinds of clauses, we now give—

AN OUTLINE LESSON ON

ADJECTIVAL CLAUSES.

TRUTHS TAUGHT AND METHOD OF TEACHING.

I. The Function discovered.

Write on the B.B. sentences (a) in 1, 2, 3, and 4. Let the children analyse them, and so discover the function of the word in italics.

Beneath each, write sentence (b), and lead children to see that the group of words in italics performs the same function as the one word in (a).

Analyse the sentences.

Tabulate the uses thus—

1. To enlarge the Subject.
2. To enlarge the Object.
3. To enlarge a noun in the complement.
4. To enlarge a noun in any part of the sentence.

II. The New Term taught.

1. **Clause.**—If not previously taught, teach as in the preceding lesson.

2. **Adjectival.**—Examine the words in italics in sentences (a). Note that each is an **Adjective**. Since the clauses in (b) do the work of adjectives, let children suggest a suitable name for them.

BLACK-BOARD ILLUSTRATIONS.

I.

1. (a) Uneasy lies the *crowned* head.
(b) Uneasy lies the head *that wears a crown*.
2. (a) I have a *rich* uncle.
(b) I have an uncle *who is rich*.
3. (a) It seemed but a *useless* box.
(b) It seemed but a box *which was useless*.
4. { (a) He walked to *my* house.
 (b) He walked to the house *in which I live*.
- { (a) I will send John, *my trusty* servant.
 (b) I will send John, the servant *whom I trust*.

Enlar Sub	Sub	Pred.	Obj	Extension.
(a) 1 the 2. crowned	head	lies		uneasy
(b) 1. the 2. that wears a crown	head	lies		uneasy

&c.

&c.

&c.

TRUTHS TAUGHT AND METHOD
OF TEACHING.

Help them to the—

Induction.—**An Adjective Clause** is one which does the work of an adjective in the sentence.

III. Exercises.

(a) Give sentences, and require the children to *substitute clauses* for the adjectives.

(b) Give complex sentences, and require children to analyse them as in I.

BLACK-BOARD ILLUSTRATIONS.

III.

(a) The *poor* man died.

(b) The men *whom you sent* are skilful.

In the teaching examples it will be noted that in each case the words *introducing* the clauses *are different*. This was done in order to show children that they must rely solely on the function of the clause.

22. Hints for Analysing Complex Sentences.—The following hints may prove of service:—

(1) Find the Principal sentence first.

(2) Take the *predicate* of the principal sentence, and ask the questions you have been taught in order to find the *subject*: these sentences will tell if the subject is a **Noun clause**.

(3) Now ask the questions to find the *objects*, both direct and indirect: you will thus see if a **Noun clause** forms either of these.

(4) Next ask the questions to find the *enlargements* of subject and object: these questions will show if there are any **Adjectival clauses** enlarging subject or object.

(5) Then ask the questions to find the *extensions* of the predicate; any clause which answers one of these questions will be an **Adverbial clause**.

(6) Pay little attention to words introducing clauses; these only indicate what a clause *may* be.

(7) Remember that you *may* have an adjectival clause in any part of the sentence where there is a noun, an adverbial clause in any part where there is a verb, and a noun clause in any part where a noun may be used.

(8) The verb in a clause must be a **finite verb**.

The following is a convenient form of setting out the analysis:—

EXAMPLES OF ANALYSIS OF COMPLEX SENTENCES.

I.—With detailed analysis of the Clause:

1. He has heard that men of few words are the best men.
2. The little pile that tops the summit of that craggy hill shall be my dwelling.
3. I'll look no more, lest my brain turn.

Sentence	Kind of Sentence.	Relation.	Enlarge-ment	Subject.	Predicate.	Enlarge-ment.	Object.	Extension.
A. He has heard	Principal Sent			He	has heard		B.	
B. [that] men of few words are the best men.	Noun Clause.	object of A.	of few words	men	are the best men.			
C. The little pile shall be my dwelling.	Principal Sent		1 the 2 little 3. D.	pile	shall be my dwelling.			
D. that tops the summit of that craggy hill.	Adjectival Clause.	enlarges subject of C.		that	tops	1 the 2. of that craggy hill.	summit	
E. I'll look no more,	Principal Sent			I	will look			1. no more, 2. F.
F. [lest] my brain turn	Adverbial Clause of reason	extends of E	my	brain	turn.			

II.—Without detailed analysis of the Clause:

He has heard that men of few words are the best men

Sentence.	Kind of Sentence.	Relation.	Enlarge-ment	Subject.	Predicate.	Enlarge-ment.	Object.	Extension.
A. He has heard	Principal Sent.							
B. that men of few words are the best men.	Noun Clause.	object of A.		He	has heard		that men of few words are the best men	

Sentences 2 and 3 will be done in a similar manner

The second scheme meets the Code Requirements of Standard V in Course A.

23. The Formation of Nouns, Adjectives, and Verbs.—This part of the work is interesting to children, and presents little difficulty. The words should be introduced into sentences so that their meaning may be discovered from their use. The examples should then be collected, and the meaning of the common termination ascertained, *e.g.*—

- (1) It was a *childish* act = an act *like* a child would do.
 • It was a *boyish* game = a game *like* a boy would play.
ish added to a *noun* changes the noun into an *adjective*.
 „ „ means *like, of the nature of*.
- (2) It had a *sweetish* taste = a taste *somewhat* sweet.
 The flower was of a *reddish* colour = a colour *somewhat* red.
ish added to an *adjective* forms another *adjective* in which the force of the word is weakened.
 „ „ means *somewhat, a little*.

24. Prefixes and Suffixes.—These should be taught through their use in sentences.

If we write—

- (1) The beauty of the scene will *attract* him;
- (2) The cares of business *distract* him;
- (3) We will *extract* the thorn;
- (4) I will not *retract* what I have said;
- (5) We know cold causes bodies to *contract*,

we shall see—

- (a) that *tract* is common to each of the words;
- (b) that each word has a distinct meaning of its own: they cannot be interchanged;
- (c) that the initial syllable or *prefix*, as it is called, must be the cause of the difference in meaning, since the termination is the same.

We know that *tract* comes from a Latin word meaning *to draw*. Examining the meaning of the words in the above sentences we find—

at-tract means *to draw* some person or thing *to* something else;
dis-tract „ *to draw* one's thoughts *here and there*;
ex-tract „ *to draw* something *out*;
re-tract „ *to draw* something *back*;
con-tract „ *to draw* things *together*.

If we examine other words having these prefixes, we shall find the meaning of the prefix is the same in each word; hence we learn that *each prefix has a meaning of its own*; and, knowing this meaning we shall be enabled to find the exact meaning of words very similar in appearance.

SUMMARY.

1. Grammar is taught chiefly for the mental training it affords, but also as an aid to correct speech and writing.
2. The rules and definitions of grammar must be taught inductively and applied deductively.
3. Lessons in grammar should be supplemented by simple exercises in composition.
4. There are five schemes of work in addition to two special schemes.
5. The sentence should be the starting-point. Grammar should be taught through analysis.
6. Intelligent effort must be demanded of the children.
7. Precede formal lessons in grammar by the formation of sentences orally.
8. The noun and verb are better taught together.
9. The structure and function of the phrase is important.
10. Special attention must be given to the same word performing different functions.
11. Classification must be based on *one* leading idea and be exhaustive.
12. The parsing lesson is intended to revise and apply truths already taught.
13. The kind of clause depends upon its function in the sentence.
14. Prefixes and suffixes should be taught through their use in sentences.

GOVERNMENT QUESTIONS.

1. Should the teaching of grammar begin with parsing or analysis? At what stage of a child's progress might each be commenced? Show clearly how the teaching of analysis and composition may be made mutually helpful.
2. In teaching grammar say in what order you would teach the Parts of Speech, and give your reasons. What should be taken first—the examples or the definitions, and why?
3. Write notes of a lesson on the predicate of a sentence.
4. Why is it useful to require children to form sentences of their own, in illustration of your grammar lessons? Give some examples of exercises of this kind, both oral and written, such as might be required of children in the Third Standard.
5. Suppose you were giving a first lesson on the Adjective to a class which had just passed the Second Standard examination, how would you set about it, and what illustrations would you give? What is your definition of an adjective, and at what point in your lesson would you give the definition to your class?
6. Write half a dozen exercises for Standard III., intended to show that

the children understand what an adjective is, and what its function is in a sentence.

7. In the sentence "He came quickly", which is the better answer of the two following, in reply to the question—"What part of speech is quickly?" (1) "Quickly is an adverb because it ends in -ly"; or (2) "Quickly tells you how he came, and therefore it is an adverb". Give the reasons for your preference.

8. Give a sketch of a first lesson on the adverb.

9. Give examples of simple sentences that may be formed by Third Standard children to illustrate the position of the verb and the adjective in a sentence.

10. Show how you would give to children of the Third Standard, a first lesson on the different uses of adjectives and adverbs. Say what illustrations you would use, and whether you would use them at the beginning or towards the end of your lesson.

11. Explain, as to a class, the meaning of the word "tense" in grammar, and give an outline of a first lesson on the tenses.

12. Show how you would make the distinction between transitive and intransitive verbs understood by scholars in the Fourth Standard, and how far it would help you to require the children to make or find illustrations of their own.

13. Show by two or three illustrative sentences how you would help scholars to determine the case of a relative pronoun.

14. Show that children are liable to confound nouns and verbs and adjectives and verbs in first lessons on grammar. Give examples in which such confusion might arise, and state clearly how you would obviate this confusion in the examples given.

15. Show that grammar and composition may be taught simultaneously from the first. Give examples of such simple sentences as may be formed by Third Standard children to illustrate the positions of the verb and the adjective in a simple sentence.

16. Give some illustrations of the difference between compound and complex sentences.

17. Define a sentence, and give examples of simple, complex, and compound sentences relating to events in English history.

18. Give some examples of "word-building" as an exercise in English, and say what is the use of it.

19. If you were at liberty to choose between English and geography as a class subject, which would you prefer, and why would you prefer it?

20. It is stated in the *Instructions to H.M. Inspectors* that the teaching of English should be supplemented by simple exercises in composition. How may this be best done in the Third Standard?

21. What are the requirements of the Code in regard to English for Standard III., IV., V.?

22. Write notes of a lesson on—

(a) The Adjective and its Uses.

(b) Verbs—Transitive and Intransitive.

(c) Adverbs and Adverbial Phrases.

(d) Adverbial Sentences (*a first lesson*).

(e) The Complex Sentence.

(f) The Functions of the Adverb in relation to Verbs and Adjectives.

CHAPTER XVI.—GEOGRAPHY.

I. Introduction.—Geography is one of the most popular, as well as one of the most useful subjects of instruction. As the science dealing with the present appearance of the earth's surface, it appeals to all but the blind; because forms, resemblances, and changes can be seen and investigated, and pleasure derived from tracing them to their causes. The subject is so intimately connected with our environment that everyone must have some acquaintance with it whether he will or not. No intelligent person can live in a district without observing some of the characteristics of its surface, the nature of the rocks, the character of the climate, the varieties of plant and animal life, and the changes wrought by time and circumstances. With such things geography deals; hence its direct personal interest.

The earth is the home of man. Each characteristic area, with its valleys, hills, mountains, rivers, lakes, and seas, is an apartment, of which the vegetation and the animal life are the furniture.

The title-page of a geography book published in 1712, here given, will doubtless impress the reader with the comprehensiveness of the subject.

“A new description of the World, or, A Compendious treatise of the Empires, Kingdoms, States, Provinces, Countries, Islands, Cities, and Towns of Europe, Asia, Africa, and America: In their Situation, Product, Manufactures, and Commodities, Geographical and Historical, with an account of the Natures of the People, in their Habits, Customs, Wars, Religions, and Policy, &c., as also of the Rarities, Wonders, and Curiosities of fishes, beasts, birds, rivers, mountains, plants, &c., with several remarkable revolutions and delightful histories.”

And further, to quote from the “Introduction” to the same:—

“By well considering this work, a mean capacity may suddenly know how the world's mighty fabric is disposed, and soon become acquainted with every country under heaven, enough to render him capable, not only of contemplating the goodness of the Almighty in His works and creatures, but readily discoursing, even with the most knowing travellers,

and without hazarding the danger of treacherous seas, winds, robbers, and a world of inconveniences that attend an expensive search into these affairs; securely travel in imagination from pole to pole."

2. Educative Value.—No other subject better deserves to be called *object* teaching; for the senses must be active, or nothing effective can be done. The keen observation of one's surroundings, the picturing of the distant from the knowledge of that which is near, and the study of the adaptability of the earth to the production of animal and vegetable life, together with their distribution over the earth and their uses to man, must tend to humanize and also to awaken intelligence.

(1) *Observation is trained and developed* by questioning on the neighbourhood, e.g. the nature of the roads, the things seen by children on their way to school, the flowers in bloom, the animals useful and domestic, kinds of grain, vegetables, or fruit, the sky and the winds,—to all of these answers should be given with accuracy and precision. The interest and attention thus awakened will not only afford valuable mental training, but will also lay a foundation upon which geographical knowledge can be built.

(2) *The power of imagination is directed and trained* when the familiar hill or brooklet is made to convey the idea of a mountain or river; when swampy, sandy, or level tracts are made to form appropriate images for marshes, deserts, or plains; and when the productions of the home-district become the familiar types of distant and unfamiliar productions.

(3) *The faculty of memory is strengthened* through the association of words with things. Memorizing lists of names is uninteresting and uneducative; but when ideas have been conveyed by means of form, impressions, pictorial illustration, &c., or names have been associated with interesting events, &c., the key to an improved memory has been discovered; then facts may be expected to be remembered. A fair balance should be maintained between the power to acquire facts and the power to retain facts.

(4) *General intelligence is awakened* by the many references to environment and personal experience. The demand for types and the selection of suitable ones preclude indifference, and create an intelligent and active interest in the larger world. Hence the mind is opened not only to the knowledge of geography, but to all subjects requiring common sense.

(5) *Useful information is imparted.*—Although this is not the chief advantage derived from the study of geography, yet it is an important one; for ignorance of the world we live in is inexcusable.

The *Instructions to H. M. I.* says:—"Geographical teaching is sometimes too much restricted to the pointing out of places on a map, or to the learning by heart of definitions, statistics, or lists of proper names. Such details, if they form the staple of the instruction, are very barren and uninteresting. Geography, if taught to good purpose, includes also a description of the physical aspects of the countries, and seeks to establish some associations between the names of places and those historical, social, or industrial facts which alone make the names of places worth remembering."

From this one sees that the information must be as comprehensive as possible, so that there may be not only an acquaintance with facts, but knowledge sufficiently extensive to be turned to practical use; as, for example, when from a study of the climatic and other conditions of certain regions inferences are drawn as to their suitability for emigration or other honourable enterprise.

(6) *Universal interest is evoked.*—This tends to peace and progress, and therefore to the best conditions for advancing civilization. The better other nations and people are known, the better they are understood, and the greater likelihood of friendship being established and maintained.

3. Means of Acquiring a Knowledge of Geography.

—(1) *Direct observation.*—Some neighbourhoods abound in appropriate examples for geographical study; others are rich in special features, but all have some natural features which may be turned to account in geographical teaching; for it is *the earth itself* that is to be studied. Whatever is investigated under the guidance of the teacher should be accurately described either in oral or written language. The idea, if not expressed, is probably very hazy; and the observation cannot be said to be complete unless accompanied by careful and exact description.

(2) *The study of maps, models, diagrams, pictures, &c.,* to impress physical features. Concrete representation is the best substitute for the things themselves, and is far more effective than verbal description.

(3) *The examination of products*—animal, vegetable, and

mineral—and' of manufactured goods to impress industrial geography.

(4) *The reading of books of travel.*—The library will usually supply books for individual instruction. Whenever a class reader is used, it should be one written in the narrative form.

(5) *General information* gained from reading, from history, study, and from object and other lessons. The daily newspaper will often provide useful material for fresh instruction, as well as for reviewing work done.

4. Apparatus Required.—If the chief natural features of the earth's surface cannot be studied in the immediate neighbourhood, then representations of them are absolutely essential; and no pains should be spared in obtaining suitable ones. The means will oftentimes be found close at hand, and may be provided at a trifling cost.

(1) **Pictures.**—Large and correctly coloured views of places and people are available for class instruction, but they must necessarily be limited in number because of expense. Books of views and photographs are useful as well as attractive; these, however, have to be carefully circulated in the class. It will be found, as a rule, that the children are most eager to inspect them.

(2) **Models.**—The requisites are a modelling-board, sand, clay, or paper-pulp, and ingenuity on the part of the teacher. Models made before the class should be done with the co-operation of the children. As a rule these would be of a temporary character, and made of sand or clay. A little salt added to the sand is an improvement. The best permanent models are made with plaster or paper-pulp. The following has been proved a successful method of making a model or relief-map of England:—

- (a) Tear newspapers or any waste paper into shreds; (b) soak thoroughly; (c) stir with a stick or roll in the hands until reduced to pulp; (d) pour off superfluous water; (e) draw outline of England on a board or piece of cardboard; (f) cover the surface with a thin layer of pulp; (g) shape the outline with knife or hand; (h) add pulp for hills and mountains; (i) press up high coast-lines and flatten the low; (j) leave to dry; (k) trace river courses, &c.; (l) add any desirable colouring.

In this way a permanent model is formed, most inexpensive,

but exceedingly graphic, and one that the children themselves can prepare in their own homes. Similarly models may be made to show miniature rivers, waterfalls, mountains, &c.

Apparatus for illustrating the causes of night and day, the seasons, &c., when home-made, is not very satisfactory; but a large sphere and a bull's-eye lantern or a lamp may be successfully used in place of expensive apparatus.

A sun-dial, a mariner's compass, a thermometer, and a barometer may each be turned to good account.

(3) **The Globe.**—This, of course, is a model specially designed for showing the shape of the earth, the distribution of land and water, and the inclination of the earth's axis. It is absolutely essential for instruction in geography. An orange is a very inaccurate substitute.

(4) **Plans.**—As geography implies a knowledge of form, it necessarily follows that the manner of representing solid forms upon flat surfaces should be understood. In every school it is desirable to draw and mount an accurate plan of the school and playground, as well as one of the school district. Should such not be provided, the teacher must make them, first taking actual measurements, and then determining a convenient scale to which to draw. The ordnance maps of districts will be very useful for this purpose. When finished the drawing should be varnished and mounted. Plans made in cork or wood are more readily understood by young children.

(5) **Maps.**—These should be accurate, clear, and not overcrowded with names. Among the maps necessary are the School District Map, the Parish, the County, England, British Isles, Europe, Asia, Africa, North and South America, the World in hemispheres, and the World on Mercator's projection. Single maps or atlases for the children of the class, as well as blank maps, are a great advantage.

The *Instructions to H.M.I.* says—"Such maps (maps drawn by the children), if of any part of Great Britain and Ireland, should be accompanied by a scale of miles; and if of large and distant countries, by the lines of latitude and longitude. In order that the conditions laid down for the geographical teaching of the lower classes may be fulfilled, a globe and good maps, both of the county and of the parish or immediate neighbourhood in which the school is situated, should form part of the school apparatus, and the exact distances of a

few near and familiar places should be known. It is useful to mark on the floor of the schoolroom the meridian line, in order that the points of compass shall be known in relation to the school itself, as well as on a map."

(6) **Sketches.**—A skilful teacher ever ready to illustrate with chalk upon the black-board, has at his command a most important aid in teaching geography. The sketches made before the class should always be copied at the time by the children, and afterwards reproduced from memory. Even though pictorial illustrations are provided, it is often necessary to sketch some form upon the black-board.

(7) **The Lantern.**—Much has been said in praise of the magic lantern. Certainly by no other means can such graphic, interesting, and instructive pictures of the same size and accuracy be produced. At present expense and convenience stand in the way of the lantern being generally adopted. When it is used the teacher must not be satisfied with arousing interest only; he must see that the children have grasped the points of the lesson, by requiring them to be stated either orally or in writing.

5. How to Teach Geography:

(1) **Begin with an Accurate Description of the Locality.**—Lessons on form and relative position are an essential foundation for geographical teaching, but they can hardly be styled geography lessons. In the surroundings of the home will probably be found types of the chief physical features, such as hills, slopes, valleys, brooks, rivers, &c., and each of these types should become the standard for a mental picture of something larger. As size is the cause of much of the difference in appearance, it is essential to take some characteristic portion of the locality as the unit of area, length, or height. This unit will become the standard by which all space outside the ken of observation will be measured. The exact distances of a few near and familiar places must be known to ensure correct appreciation of that which is remote.

(2) **Model the Features of the Locality.**—The modelling-board should be freely used. Sand, clay, or paper-pulp are materials readily obtained for the use of the teacher and pupils. Let the children express their own idea of a definite form by means of a model, as they would when at play by the sea-shore.

If possible let the forms be first observed from the school windows. When this is not possible, references to certain spots in a walk, or to certain places specially visited, should supply the negative. Besides modelling, drawing with free lines on the black-board (and on slates or paper) by the teacher and pupils should be encouraged. Success depends upon the thoroughness with which children are taught to *observe*; this direction of the children's observation requires great skill on the teacher's part. The exercises mentioned will enable the pupils to form full and accurate mental pictures of the portions of land studied; and when these are gained, the imagination, assisted by the teacher's vivid description, will enable them to form a true and faithful picture of the wider world.

(3) **Impress Facts by Association.**—"It is very desirable that detailed matter, consisting of names conveying no associations likely to interest children, should be excluded from the teaching" (*Circular to H.M.I.*). Thus it is seen that only "living" geography is wanted. Whenever pictorial illustration or the graphic description of historical events accompanies a name, a lively interest is created, and the memory is aided. Allusions to great events, as migrations, the extensions of empire by conquest or colonization, the march of armies, &c., when accompanied by reference to maps or sketches, give zest to geographical study. Again, comparisons of situations, climatic influences, and products are useful aids.

"Geographical teaching is sometimes too much restricted to the pointing out of places on a map, or to the learning by heart of definitions, statistics, or lists of proper names. Such details, if they form the staple of the instruction, are very barren and uninteresting. Geography, if taught to good purpose, includes also a description of the physical aspects of the countries, and seeks to establish some associations between the names of places and those historical, social, or industrial facts which alone make the names of places worth remembering." (*Instructions to H.M.I.*)

Descriptive poetry is sometimes available, as when we read of the Thames:

"Whose ample breast displays unfurled
The ensigns of the assembled world".

Such quotations may be used as memory gems for impressing facts.

(4) **Use Specimens when Dealing with Productions.**—Children may *know* the objects mentioned, but it is far better to present them for inspection than to depend upon references. Wool and woollen cloth may represent the industries of Yorkshire and the West of England; cotton, cotton goods, and cotton-plant, those of Lancashire and America or India; flax and linen, Ireland; and tea and silk, China. Even songs may familiarize the scholars with Germany as the “Land of Song”, music with Italy as the “Land of Music”, and marble figures with Greece as the “Land of Sculpture”; although properly these impress facts by association, as in the case of “Beautiful France”.

These natural or manufactured articles are not simply to be seen; they are to be used as aids in teaching. Take the case of rice. Its natural history teaches that it requires excessive moisture and heat for development; hence the inference that wherever it grows the region must fulfil these conditions, and such conditions exist in warm regions near the mouths of rivers or near river banks.

(5) **Trace the Causes, Advantages, and Disadvantages of Characteristic Features.**—The west coasts of Scotland and Ireland being exposed to the wild waves of the Atlantic are consequently rugged and irregular. The characteristics of the Scandinavian coast are then easily understood. The northern Highlands of Scotland are barren, the rivers short and swift, and the district generally inaccessible; hence the small towns and scanty population of this region. The British Islands are situated almost in the centre of the Land Hemisphere; infer their natural advantages for commerce. Generally, rugged coasts suggest exposure to the violence of storms; swift rivers and sudden slopes, bad navigation; good harbours and navigable rivers, abundant commerce; equable climate, open seas; luxuriant forests, great heat and regular rains; desert, no rains. Further, the existence of mineral wealth, the water-supply, the character of the land surface, and the climatic conditions determine the nature of the industries and the character of the people. Undoubtedly the search for *causes* increases the interest in facts and fixes them clearly and distinctly. As an example, consider the ever-changing form of a delta. The deposition and spreading out of material at the mouths of rivers is understood when observation has been made of the crumbling bank, rushing water, pebbly bed, and sediment in the water.

(6) **Encourage the Children to Delight in 'Accurate Descriptions.**—It is well to take advantage of the critical disposition of children, and let them detect weaknesses and amend descriptions. Much effort and exercise of judgment will be demanded; but children will respond when stimulated. Approximate measurements should be based on exact ones. The exact measurements of certain well-known objects, *e.g.* rivers, countries, &c., should become the criterion for reference. A distant place need not necessarily be measured in miles, but in time taken to accomplish the journey, as five hours from London to York, seven hours to Paris, three weeks to Bombay, six weeks to Sydney.

Then for size or area, the accurate number of square miles will not avail so much as the number of Englands in Hindostan, or the number of times the British Islands might be contained in Australia.

But besides clear ideas with regard to distance and size, it is essential to obtain accurate detailed descriptions of people, places, &c., in sentences. Assistance is given when such descriptive terms as "Beautiful France", "Sunny Italy", "Enterprising English", "Indolent Turk", "Emerald Isle", "Land o' Cakes", "Black Country", "Lake District" are employed. Care must be taken to ensure the truth of the descriptions.

(7) **Frequently Recapitulate, and avoid a mere Memory of Names.**—Progress is commensurate with the completeness of the previous knowledge, and therefore careful and systematic review of each step must be made before proceeding to the successive steps. It must be remembered that a knowledge of geography has to be *built up*. Without the position of the high lands and the directions of the slopes are known, it is useless to expect an intelligent knowledge of the water-system of a country. A final recapitulation of the whole should take place at the conclusion of the lesson. The black-board summary of sketches and information is sometimes made the basis of a written exercise, done either in class or at home. It cannot be too strongly urged that names should be linked with useful information, so that repeating or seeing them calls up facts to the mind: *e.g.* Chester and Winchester call up old Roman camps; Hastings, the landing of William the Conqueror; Manchester, the site of an old city, enormous cotton trade, and the ship canal.

6. Order of Instruction:

(1) **Position or Form Lessons.**—It may not be generally recognized that these are fundamental exercises, on which alone a sound knowledge of geography can be built. The eye requires training to note *position*, both relative and fixed. This is done when objects or coloured discs are placed in certain positions, sometimes indiscriminately, sometimes in the form of a design, then parts are removed and replaced, taking care that descriptive words accompany the actions. Again, the observation of *form* is a preliminary training necessary for the development of true ideas of the distant and unseen through the imagination.

(2) **Topography of the Neighbourhood.**—In most cases this is considered the first step in geography. As the distinguishing features of the district should become the *standard of comparison*, it follows that no instruction in geography is properly conveyed without this previous knowledge. The general aspect—the hills, the slopes, directions of the roads, streams, &c., trade, traffic, public buildings, and many other interesting matters, municipal as well as physical, all combine to form a basis for future instruction.

(3) **Physical Geography and its Relation to Industrial Geography.**—Adequate illustration and graphic description following upon the previous instruction make this stage really attractive. It is essential to the understanding of the next stage. From the physical features generally we are led to determine temperature, productions, occupations, and the general character of the people inhabiting those parts.

(4) **Political Geography.**—Government, and changes wrought by civilization, can be appreciated only by maturer minds; but facts such as divisions, character of the people as citizens, habits, &c., can be understood by young children. Too sharp a line of division should never be drawn between the physical and political geography of a country.

7. **Schedules of Instruction.**—The Education Code gives entire freedom in regard both to the selection and arrangement of topics and to the methods employed in teaching them; but courses of study are sketched out which, though varied in form, are intended to be substantially alike in difficulty and educational value.

Schedule II., in seven stages, grades the geography of the

world. In the Alternative Schedules it will be noticed that—

(1) Course A leaves the first three divisions unaltered; but the remaining four deal particularly with physical facts and phenomena.

(2) Course B treats geography from the commercial and industrial side.

(3) Course C allows geography in the first four stages, and history in the remaining three.

There is yet another schedule, which is for small schools, and is divided into 1st and 2nd stages only, permitting scholars to remain studying the lower stage until prepared for advancement.

These programmes require further subdivision in order to show the number and nature of the lessons. Some help follows with this end in view.

PLANS OF INSTRUCTION.

8. First Step.—The earliest lessons are of vital importance. With no early training there can be no real grasp of the subject, no real attraction, and therefore no real benefit. Previous to pursuing the course suggested below, it is assumed that systematic lessons in *position* and *form* have been given in the earlier years. By referring to Schedule II. it will be seen that the same syllabus for the first stage is repeated five times. Yet apparently it is an uninteresting one. The following course of lessons will show it to be not only a necessary and instructive foundation course, but also an interesting one.

A. Observation of Forms, and the General Representation of these by Building and Drawing.

(No scale is to be used, but the general proportion should be preserved.)

(1) *Form of class-room.*—The children to represent the four walls by sticks laid upon the slates. The teacher does the same with larger sticks on the table or the black-board placed in a horizontal position either on the table or floor. Draw round the sticks; remove them, then question on lines and proportionate lengths; give a name to the form. Ask for similar forms with four boundary lines. Place the black-board on the easel; point to the walls and then to the corresponding lines.

(2) *Position of furniture.*—Provide the children with chequered slates or paper, and the teacher with a chequered black-board. Draw the plan of the room; note clearly the relative position of table, desks, &c., and guide the class in marking the same in the plan.

(3) *Relation of the room to the school.*—According to the working position of the child, the parts will be to the right, left, behind, or front; and therefore these must be considered under the teacher's guidance. Then build them up, and afterwards draw them.

(4) *Form of the whole school.*—Sticks would now be troublesome, so encourage free drawing; or better still, use squared slates or papers.

(5) *Form of school and playground.*—Draw the school, and put around it the playground walls, naming each, as entrance-gate wall, right-hand wall, &c.

(6) *Roads round the school.*—If there is only one, prolong it in the drawing. Let "S" represent the school in the middle of the slates. The teacher should have prepared a model of sand or clay. Mark any special building. Talk of the traffic to other places.

(7) *Hills or open spaces near.*—Select a road, model it, and mark fields or open spaces near it. Draw a plan of it on the black-board. This the children will copy. Comment on the slopes, the vegetation, &c.

(8) *Hills and slopes.*—Select a road; climb a hill, and describe the scene. Make and show a model, pointing out the lines of hills, valleys, rivers, buildings, &c.

(9) *Brooks and bridges.*—Follow the brook or water-road; mark the bridges on the model. Observe the slopes and running water.

B. Observation of Direction and Cardinal Points.

(1) *Three positions of the sun.*—Refer to sunrise, noon-tide, and sunset. Draw a circle, or take a hoop representing the sky-line. Mark on this the positions of the sun. Show the need of a fourth point in the circle. Examine the mariner's compass.

(2) *The northern direction.*—Trace a road, facing the cold wind and snow. Travel on and on in imagination to the land of perpetual snow.

(3) *The southern direction.*—Take an imaginary journey to the warm climes.

(4) *The eastern direction.*—Note the dry winds, the drought, and morning sun.

(5) *The western direction.*—Note the soft wind, cloudy sky, rain, and sunset.

(6) *North-east and south-west.*—Locate parts of the district.

(7) *North-west and south-east.*—Complete the divisions of the sky-line circle.

(8) *Uses of sign-posts and vane.*—One is for the names of the fixed directions, the other to mark the direction of the wind.

(9) *Direction in the class-room.*—The teacher, assisted by the children, will mark on the floor, the ceiling, or the wall the points of the compass.

C. Recapitulation of Section I.; Extension of Knowledge, introducing Scale and Proportion.

(1) *Plans of small objects.*—First draw the correct size on the black-board, and then to the scale of a half or a quarter, a pencil-box, a slate, &c. Draw the squared slate half the size on the squared slate.

(2) *The class-room.*—Let a child measure a wall; then let the children draw it on the chequered slate, and the teacher on the chequered board lying horizontally. Each square is equal to one foot. This is the new measure or scale.

(3) *The school.*—Prepare the dimensions; each square is to equal one yard. When the black-board is placed on the easel the N. is uppermost.

(4) *The school and playground.*—Each square may now represent 5 yards.

(5) *Roads.*—Ordnance survey maps will supply the copy. In the drawing made by the children, one square may equal a mile or half a mile.

(6) *The school district.*—A graphed copy on a small scale should be supplied to each child, and systematically examined.

Note.—Some of these lessons will require repetition.

D. Meaning of a Map, and its Markings, together with its uses for representing form, relative position, size, distance, and direction.

(1) *Drawing an outline.*—Select and model with sand, clay, or paper-pulp the outline of the Isle of Wight, Isle of Man, Sheppey, Thanet, Anglesea, or some known tract in a lake. Supply the class with a graphed copy of the same. Note the

characteristic points; draw from point to point on the black-board, and let the children trace over the outline supplied. Compare with the model, and infer that the drawing gives shape only. The shape of large tracts of land is shown in the same way, and is called a *map*.

(2) *Similar model*.—Mark coast-line, rivers, and water-roads.

(3) „ „ .—Mark hills, lakes, &c.

• (4) „ „ .—Mark towns.

(5) *Model of England*.—Outline copy supplied to each child. Compare with the model, and mark over coast-line, hills, rivers, and towns.

(6) *Model of England*.—Outline copy for class, showing railways. Give the lengths in miles, and refer to scale and proportion.

(7) *Map of England*.—Graphed copies supplied to the class are compared with the model and the markings reviewed.

(8) *Map of England*.—Conversational lesson on the relative position of the chief features.

(9) *Map of England*.—Judging distances by reference to the scale of miles. Judging direction.

A capable teacher will simply use this programme as suggestive. It should be borne in mind that unless the knowledge be full and complete up to this point it is useless going forward. Text-books should be avoided in order to study home geography. Success in forming mental pictures of future work depends largely upon the thoroughness of this course.

9. Second Step.—This completes the foundation on which to raise a safe superstructure. A course consisting of definitions appears at first sight barren and uninteresting, but when illustrations and ideas precede the definition the work is far from “dry”.

A. Definitions.

(1) *Land and water*.—Teach the general aspect of the earth by reference to the map on Mercator’s projection. Observe the surface of the earth divided into two parts—the one solid, called land; the other liquid, called water. By questioning lead the children to see how this is adapted to our necessities—the solid earth to walk upon, to build upon, and to produce food; and the water, a necessary of life, to afford easy means of communication. Teach the proportions by a model or diagram.

(2) *Land forms*, e.g. plains, hills, mountains, coasts, capes, peninsulas, islands, isthmuses, continents. The ideas are to be

conveyed by modelling, relief-maps, or pictures. No definition is to be given until the idea is established. For example, **a mountain** may be taught thus:—

- (a) *All land is not level.* Refer to view from the school windows, or to some walk, or familiar hilly tract. Model the part and note its unevenness, its elevations, and depressions.
- (b) *Some land rises to a great height.*—Prepare a model. Show pictures, and vividly describe the mountain scene, exciting the child's imagination until a fairly good estimate of a mountain is formed. Obtain by questioning some such definition as "land rising to a height is called a hill", "land rising to a very great height is called a mountain".
- (c) *Parts.*—Model a mountain, naming it Snowdon or Sca Fell. Teach from the model the terms slopes, base, and summit.
- (d) *Situation in England.*—Point on relief-map to chains, groups, and isolated peaks.
- (3) *Water forms, e.g. rivers, lakes, straits, bays, gulfs, seas, oceans.* Begin with the best home representative, and contrast with the land forms, e.g. a lake is the opposite of an island.

✓ **A lake** may be taught thus:—

- (a) *Water collects in hollows.*—Illustrate by a model, and refer to pools, &c., in the playground, or road, after rains.
- (b) *Lake scenery.*—Children always collect near water for amusement. Adults go to lake districts where larger pools have pretty surroundings. Point out these districts on a relief-map of England, and give the names.
- (c) *The definition.*—Lead the class to form one. Some will say "a large pond".
- (d) *Uses.*—Draw out the children's knowledge of the use of ponds for amusement, bathing, boating, fishing, skating, and the supply of ice. Then teach drainage and storage for drinking purposes.

B. The Globe and its Teachings.

(1) *The Globe.*—Shape of the earth. Colouring distinguishes land and water. Teach the axis, and illustrate the earth's revolution, causing day and night.

(2) *The Globe.*—There are two divisions—the eastern half

and the western half, the Old and New World; the northern half and the southern half, or the land hemisphere and water hemisphere. Teach the equator. Compare maps.

(3) *The Globe*.—Treat of its size and distances, the variety of climate, and so lead on to the zones. Make a diagram, and locate the races of people as well as products.

(4) *Journey round the Globe*.—Refer to a voyage round the world, and review form, size, divisions of land forms and water forms, and zones.

(5) *Globe and the map*.—Use Mercator's projection and review the previous work, noting particularly oceans and continents.

(6) *Globe and the Eastern and Western Hemispheres*.—Trace the routes to America, across America, across Europe, P. and O. route, &c.

C. Physical Geography of Hills and Rivers.

(1) *Hills* as they affect rainfall and protect plains. Teach by sand modelling.

(2) *Hills* are the source of *springs*—watersheds. Use a model of sand, gravel, and clay.

(3) *Hills* and *mineral* supply. Use a model showing strata of different kinds. Place layers in a glass vessel; draw diagrams.

(4) *Vegetation* from base to summit of mountains. Use pictures or specimens.

(5) *Avulanches, glaciers, &c.*—Effects of air, water, and frost.

(6) *Rivers* begin in springs, glaciers, &c. Some are full in winter, others only in summer; some are always full.

(7) *Rivers and lake expansions*.—Prepare model of paper-pulp, clay, or plaster.

(8) *Rapids and waterfalls*.—Prepare model.

(9) *Rivers remove material*.—Show the effects of running water. Lead on to delta and cañon.

(10) *River current*.—Treat of its rate and direction; lead on to locks and tidal current.

10. Third Step.—The way has now been prepared for the beneficial study of the geography of a country. England, our home, is first in importance, and accordingly should take precedence in order of teaching as also in thoroughness of instruction. Other countries should be treated with very much less detail.

The outlines of England were illustrated pretty freely in the Second Step, so that progress will now be rapid. It is

advisable to avoid the arbitrary arrangement 'of text-books, and any system that tends to isolation, as county by county. Far better arrange a plan for grouping and associating facts as much as possible, so that no lesson will be without reference to previous work; for then revision will be constant and effective, and the memory work rendered easy and ready for use, thereby assisting the building-up of knowledge. The following has been found a useful course of lessons for teaching the geography of England.

A. Position and Surfaces.

(1) *British Isles*.—Situation with regard to Europe, the World, and the Zones pointed out on maps. Races of people and parts inhabited by them.

(2) *England*.—Situation, form of outline, surroundings. Use relief-map. Origin of name.

(3) *Surface*.—Relief-map to show mountainous in north and west, hilly in the south, plains in the east and centre, and others dispersed over the country.

(4) *Mountains*.—Use relief-map, wall-map, and pictures. Situation, form, and arrangement, as chain, group, or isolated peak. Names of highest points. Watershed, direction of slopes. Use for flocks, vegetation, protection, minerals, and amusement.

(5) *Hills*.—Model and sketch lines from Salisbury Plain eastwards, to the north-east, and west. Characteristic appearance. Note chalk, &c., endings on coast, as Flamborough Head, North Foreland, Beachy Head. In this way revise the capes, showing their connection with the hills.

(6) *Plains*.—Refer from the model to the map. Note rivers, towns, and population. Characteristics—pasture and agriculture; connection with low-lying parts on coast in form of bays and openings. Communications—highways, as roads, rivers, and canals.

B. Water Systems.

(1) *Basin of the Thames*.—Trace the boundaries of the basin on a large wall-map, or relief-map. Let the class draw lines on slates for the hills, and teacher build up model with sand. Examine the relief-map, and study the character and direction of the general slope, which is gradual from west to east. Point out the secondary slopes. Let the children mark on slates, and the teacher build with sand. Through rose of water-can or castor-box gently pour water over model, and note main stream

and tributaries. Follow the course from source to mouth, giving names and learning them.

(2) *Basin of the Thames*.—Divide into upper and lower. Journey in imagination along it, referring to nature of *navigation*, as tide, current, locks; the natural *productions*, including characteristic crops in various parts of the basin; the fish of the streams, and the supply of water for drinking purposes; the *towns* on the banks, with the occupations of the people. Conclude with the *commercial importance* of the river. The teacher should fill in a sketch map on the black-board, and the children follow stage by stage on a slate or prepared outline.

(3) *Basin of the Severn*.—Compare with the Thames in physical aspect.

(4) *Basin of the Severn*.—Navigation, bore, productions, towns, &c.

(5) *The Trent*.—Course and estuary.

(6) *The Trent*.—Nature of industries.

(7) *The Ouse*.—Note many short feeders.

(8) *The Ouse*.—Trade.

(9) Rivers from the west slope of the Pennines.

(10) Rivers from the east slope.

(11) Rivers from the central hills.

(12) Rivers from the southern hills.

(13) Rivers from the Welsh mountains.

(14) The English lakes and canals.

C. The Centres of Population.

(1) *The coal districts*.—Situation, extent, mining population, output, distribution of coal inland and sea-ward. Ports.

(2) *Iron and steel trade*.—Situated on or near coalfields. Black country; smelting furnaces. Large towns; industrial population. Commercial importance.

(3) *Hardware and cutlery industry*.—Useful articles made at factories in the towns. Exports.

(4) *Cotton manufacture*.—Situation, supply of raw material, natural aids. Towns. Seaports with commodious docks.

(5) *Woollen manufacture*.—Supply of raw materials. Towns. Seaports and river-ports.

(6) *Linen and silk trade*.—Less distinct districts. Towns.

(7) *Earthenware*.—Chief parts, the Potteries. Towns near.

(8) *Market towns* in agricultural districts.

(9) *Health resorts*.

(10) *Historical towns or cities*.

- (11) *Naval ports* and protection of trade.
 (12) *Seaports*.—River-ports and passenger traffic. Import and export trade.

D. Divisions into Counties.

(1) *The six northern*.—Mainly manufacturing. Lakes and mountains.

(2) *The eastern counties*.—Grazing and arable; cattle and corn.

(3) *The southern counties*.—Wooded, cultivated, agricultural.

(4) *The central counties*.—Manufacturing.

(5) *The Welsh counties*.—Habits and language of people. Mining, &c.

(6) *The railways northwards* from London,—G.N.R., L.N.W.R., M.R., G.E.R.

(7) *The southern railways*.—G.W.R., L.S.W.R., S.E.R., L.C.D.R.

II. Fourth Step.—The lessons upon a continent, or a foreign country, might proceed upon somewhat similar lines, remembering that each lesson should not be overburdened with facts; and further that the children at this stage will be better able to draw on black-board, slate, or paper, and to follow the places mentioned in their own atlases; hence progress will be more rapid. The information supplied in the oral lesson should be amplified by reading lessons of an interesting character. Instead of treating each continent in an isolated way a series of lessons could be arranged under the following divisions.

Heads of Lessons on a Continent.

- (1) The surface and climate of the continent.
- (2) The water systems of the continent.
- (3) The centres of population, with productions.
- (4) The political divisions of the continent.

Under a syllabus arranged on this plan only one or two lessons would be necessary for special treatment of a country.

Heads of Lessons on a Country.

(1) *Physical features*.—Peculiarities in character, situation, or resources; cause of present appearance; protection afforded; advantages or disadvantages that accrue.

(2) *The climate and productions*.—Proceed from the general knowledge to the particular; reasons for variety; effects of variety.

(3) *The occupation of the people*—whether agricultural, manufacturing, or maritime; centres of population.

(4) *The character of the people* as to industry, advance in arts, and education; peaceful or warlike. Government and language. Enterprise.

Further suggested outlines.

As to Section (2) in the general syllabus, the water systems of the continent, it must be borne in mind that a dozen lessons will not be necessary as in the case of the English water systems.

Take for example the following steps for a lesson on—

A. Water System of South America.

(1) *The three river systems*—distinctly defined and impressed by reference to model, relief-map, map; and by sketches.

(2) *Great extent drained*; every variety in land; fertile parts; forest plains (selvas) and grassy plains (llanos, pampas); desert regions. Coasts built up by deposits.

(3) *Variety in productions* owing to extent; dense forests; alligators and turtles; mosquitoes. India-rubber tree, ebony, mahogany, vanilla, sarsaparilla, coffee. Diamond and silver mines. Savage tribes.

(4) *Government*. Divisions into countries. Towns. Language.

Such steps will create intelligent interest, while the amount of time given, and also the number of lessons, will depend upon individual judgment.

A few more specimens of the general treatment may be useful.

B. The Climate of Europe.

(1) *The general character*.—Use map of the World, and globe. Note the situation of Europe with regard to the Equator and the Poles; observe extent from east to west greater than from north to south; greater surface within north temperate zone; infer temperate climate.

(2) *Peculiarities of climate*.—Take notice of the western seaboard and character of the westerly wind. Note Asia to the eastwards is separated from Europe by low Ural Mountains, which afford little protection from cold, dry easterly winds; observe low northern coast with little or no protection from the cold, icy blasts of the Arctic Regions; note the narrowness of the Mediterranean Sea and the proximity of Africa; refer to the elevation of Central Europe. Nature and causes of peculiarities apparent.

(3) *Effect upon the character of the people.*—Equable climate of the west and centre induces industry and enterprise; cold of north and east induces energy, thrift, patience; warmth of the south causes indolence and apathy. Exemplify by the character of the British, the Norwegian, the Turk, &c.

C. Vegetable Productions of Asia.

(1) *The surface, soil, and climate.*—Extent of surface and elevation of the central parts. Fertile soils of basins of the great southern rivers; steppes in the north; desert in the centre and west. Every variety of climate.

(2) *Three distinct regions.*—Altai district for trees; south-eastern for trees and shrubs; southern for grasses.

(3) *Productions.*—Timber and ornamental woods; fruit trees, such as are cultivated in Europe; palms, cotton, tea, coffee, sugar-cane, maize, spices, and medicinal roots.

D. Internal Communication.

(1) *The necessity.*—Refer to opening up new countries; military expeditions; difficulties of explorers; colonization; commercial enterprise; trade routes.

(2) *The means.*—Tracks, rivers, roads, canals, railways. Show how the examples given supply the need, and the special advantage of each.

(3) *The maintenance.*—Regulations for control of traffic and preservation of the highways. Central and local authorities. Collection of money—rates (local), taxes (imperial); river dues; old turnpikes.

E. Foreign Commerce.

(1) *Distinction between trade and commerce.*—The former a branch of the latter, and used more particularly with respect to the exchange “at home” of commodities which have been produced at home. Commerce is the general term including all kinds of trading, home and foreign.

(2) *Exports and imports.*—Two main branches of commerce; give etymology to explain meaning. Character of each varies with place.

(3) *Warehousing.*—Describe storage spaces about docks, immense cargoes of ships, special ports for special goods. Explain customs-duties and bonded warehouses.

(4) *Carrying.*—Chief carrying by ships; distributed by vans, by rail, by barges. Originally brought to ships by similar or other means; this depends on the nature of the country.

F. Colonies (British Possessions).

(1) *Their situation*.—Colonies and dependencies named and pointed out on the map; very numerous and extensive, but some mere spots.

(2) *Their value*.—(a) Stations at which naval and merchant ships call for food or coal supplies. Naval and military stores for protection of commerce, *e.g.* Gibraltar, Malta; Aden, Singapore; Ascension, &c. (b) New home for surplus population. Emigration to Canada, Cape Colony, Australia, &c. Improved position of people left behind. (c) Customers for manufactured goods in exchange for natural productions; commercial intercourse. Wool from Australia, returned as woollen cloth, &c. Give other numerous illustrations.

(3) *Their maintenance and government*.—Protection and security under the British flag. Mainly self-governing; do not contribute to the British revenue. They have their own parliament and own taxation. They are assisted in their defence. Recently Australia sent soldiers to help British.

12. Fifth Step.—In general terms the subjects at this stage will have been referred to somewhat frequently, and although appearing in the "*Fifth Step*" as a separate and distinct programme, it does not necessarily follow that they should be entirely reserved for the final lessons. As a matter of fact it is impossible to have taught up to the present, without associating with physical and political geography a measure of so-called mathematical geography. The subjects for consideration include natural phenomena, as climate, latitude and longitude, planetary system, tides, seasons, &c.

Any of these lessons require much skill; hence they cannot be properly undertaken by junior teachers. They must be simply treated, suitably illustrated, and carefully explained. The following lesson will illustrate the method to be followed.

NOTES OF A LESSON

ON

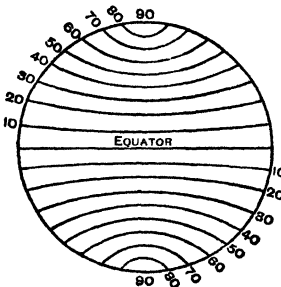
LATITUDE AND LINES OF LATITUDE.

Class—Senior Division.**Time**—40 minutes.

Aim.—To teach the necessity for some general plan of indicating the position of places on the earth, and the means employed for this purpose.

Apparatus.—Large paper discs for teacher, small ones for children; sphere, globe, map of the world.

MATTER	METHOD
<p>I. Necessity for Equator.</p> <p>The difficulty of fixing the position of a place on a sphere has led to the universally recognized plan of imagining a line drawn round the earth midway between the poles, and so speaking of places as north or south of the equator.</p>	<div data-bbox="526 577 890 746"> </div> <p>Make the points <i>a</i>, <i>b</i>, <i>c</i>, <i>d</i> on the sphere, then on the disc, children imitating. Show difficulty of fixing the positions exactly and accurately. Ask for suggestions. Draw a line round the sphere; ask for the position of the points—<i>a</i>, <i>b</i> above the line, <i>c</i>, <i>d</i> below. Draw line across discs. Give name equator; explain appropriateness of the name. Speak of points now as north or south of the equator. Ask for definition and write it on the black-board.</p>
<p>II. Necessity of Parallels of Latitude.</p> <p>Such a large number of places lie north (as well as south) of the equator that it has been found desirable to imagine lines drawn round the earth parallel to the equator; these are called parallels of latitude, or parallels showing distance north or south of the equator.</p>	<div data-bbox="523 1116 694 1293"> </div> <p><i>a</i>, <i>b</i> both north of the equator. Draw lines round the sphere and on discs; name them by numbers. "<i>a</i>" is on the second line, so is "<i>e</i>". Proceed similarly on south side. Distinguish clearly between parallels and latitude. Repeat and learn the Summary.</p>

MATTER.	METHOD.
<p>III. How numbered and used.</p> <p>The distance from the equator to the north pole is divided into 90 parts or bands, each called a degree ($69\frac{1}{2}$ miles). The southern hemisphere is similarly divided. A place 50° degrees north of the equator is indicated thus—50° N. lat.</p>	<p>Note the distance from the equator to a pole is one quarter of the circumference. Examine a globe; every ten degrees are marked. Why? Draw parallels on sphere, then on discs.</p>  <p>Number them. Show positions of England, Newfoundland, and Vancouver, all about 50° N. Give exercises on the map of the World and on the Globe.</p>

BLACK-BOARD SUMMARY.

The equator is an imaginary line round the earth midway between the poles.

Latitude (*latus*, broad) is the name of distance north or south of the equator.

Parallels of latitude are imaginary lines drawn round the earth parallel to the equator to indicate distance north or south of the equator.

A circle = 360° . $\frac{1}{4}$ of $360^\circ = 90^\circ$. " 50° N. lat."

For other lessons in this stage great reliance must be placed on diagrams, such as those representing "The Seasons" and The Planetary Systems. Still it is desirable to make models or adapt apparatus—spheres, globes, a lamp or bull's-eye lantern, a tub of water for a plane, a model ellipse, and even an orange and knitting-needle may be useful in the hands of an intelligent teacher.

SUMMARY.

1. The Earth is the home of man. Geography treats of the present appearance of that home.

2. Its educative value is (a) to direct observation, (b) to stimulate the imagination, (c) to strengthen the memory, (d) to increase general intelligence, (e) to impart useful information, (f) to excite interest in the world we live in.

3. Knowledge is acquired by (a) direct observation; (b) use of maps, models, diagrams, pictures; (c) examination of products, (d) reading books of travel, (e) and by incidental means.

4. The apparatus desirable:—(a) pictures, (b) models, (c) globe, (d) plans, (e) maps, (f) sketches, (g) the lantern.

5. Steps in teaching are (a) description of the locality, (b) modelling the locality, (c) association of facts with names, (d) examination of specimens, (e) tracing causes and effects, (f) verbal description by children, (g) frequent recapitulation.

6. Lessons in position and form constitute preparatory geography. General knowledge of the home district is followed by physical, industrial, political, and mathematical geography of parts of the world in succession.

7. Systematic lessons in position and form pave the way for (a) observation of forms, sizes and distances, and general representation by building and drawing of local parts, (b) observation of direction and cardinal points, (c) knowledge and meaning of plans and maps with scale and proportion.

8. The second step will be (a) observation and description of land and water forms, (b) the teachings of the globe, (c) the characteristics of hills and rivers.

9. The chief facts taught about a country would be (a) its situation and surface, (b) its water systems, (c) the centres of population, (d) its divisions and government. Similar divisions can be adapted to suit a "continent".

GOVERNMENT QUESTIONS.

1. Draw a plan of a schoolroom, and show how it may be applied in the teaching of scale and proportion in map-drawing to scholars.

2. Name, in progressive order of teaching, the apparatus required for lessons in geography, and show how you will give a conception of scale and proportion in map-drawing to young children.

3. State the chief points to be noticed in giving a lesson on "a River", with the order in which each point should be introduced to the class. Illustrate your answer by some English or Scotch river.

4. Show that a map differs from a picture, and explain how you would supply its deficiencies to a class beginning to learn geography.

5. Name the principal uses of a globe in teaching geography, and state fully how you would employ it in giving a lesson on day and night.

6. By what illustrations would you give children their first ideas of mountains and rivers: (a) from their own experience; (b) on the black-board?

7. A complaint is frequently made that geography, as taught in schools, is confined to list of capes, heights of mountains, &c.; how far are such

lists useful, and for what purpose? Illustrate from your knowledge of British capes and mountains.

8. How would you begin teaching geography to a class of young children? Give the substance of a few of your first lessons.

9. Show *why* and *how*, in teaching, geography and history ought to be made to throw light upon one another. Illustrate your answer.

10. What is the use of teaching children geography? What apparatus other than the usual maps do you consider necessary for the effective teaching of this subject? Show how you would use any *one* of these articles. What is the difference between physical, mathematical, commercial, and political geography? Illustrate your answer by arranging a few facts under each of these heads, in reference to some country of which you have recently learned most.

11. Describe fully the relative advantages of questioning children in geography (a) out of sight of any map; (b) on a map before them on which there are no names of places; and state the best way of combining these two methods of examination.

12. Draw a plan of some schoolroom with which you are familiar, and give its dimensions and those of the desks and chief articles of furniture. Say of what use such a plan is to young children.

13. What is the meaning of the distinction between physical, political, mathematical, and industrial geography? Say which of these should be first taught, and why.

14. What is meant by the "Comparative Method" in teaching geography? How would you use it?

15. What sort of sketch should appear on the black-board at the end of a lesson on "the Ocean", and what is the best use to make of such a sketch when it is written?

16. Draw a map of the school premises, and of the roads or streets adjacent, with which you are most familiar; and say what use you would make of such a map in teaching the elements of geography.

CHAPTER XVII.—HISTORY.

I. Importance and Attractiveness of the Subject.

"The boy who leaves school without knowing anything about the struggle for constitutional liberty in the reigns of Charles I. and James II., the Scottish struggle for religious independence at the same time, the story of the American War, the inter-relations of this country with continental nations, the abolition of the Corn Laws, and the like, is only half-educated. The history of his nation is for him more important, perhaps, than a quasi-scientific knowledge of the properties of matter and the life-history of a cockroach. The children of to-day are the men and women of to-morrow. To

them will be presented for solution the social and political problems of their time. No exact guidance for the future can be obtained from a knowledge of the past, but as a record of failure or of progress it contains materials for the reflective process on which all sound judgment is based."

These are weighty words from one of Her Majesty's Inspectors of Schools, and therein we recognize the vast importance of the study of history, which is built on the foundation of human life, and plainly teaches there is no cleft between ancient and modern life; but that the growth and progress of nations is one unbroken and still unfinished web of interlaced cause and effect, action and reaction.

Besides its importance as a preparation for future citizenship, its intellectual and moral worth must not be discounted; for by it the child is trained to take a common-sense view of characters and scenes of action, thus developing sound judgment; and also to gain wisdom in conduct from the successes and failures of individuals whose motives are unveiled to view.

The life of man is the significant thing in history, not customs, temporary struggles, and political changes; though each of these has an importance and attractiveness of its own; each appeals in a greater or less degree to the individual. "Drum and trumpet" history, and the familiar tales of heroic valour and martial triumph, are an attraction to the young mind; but even through these, the lives of the great and good, the blessings of peace and the evils of war may be profitably contemplated, and a lasting interest evoked in strong government, just laws, grand institutions, and sound progress.

2. Qualities essential in the Teacher of History.

(1) *Diligence and patience* are very necessary in order to find truth in "a mass of chaff and fiction". The researches of historians have provided text-books or books of reference which supply all kinds of material, and the real history-teacher must become acquainted with them, big though they be, or his knowledge will be meagre. Spare no pains to know more than you have to teach.

(2) *Calmness and penetration* in judging motives and conduct will enable the teacher to avoid the bias of the writer of the records, as well as to estimate the spirit of the times. He must view facts as they are presented with a judicial mind, and receive or discard opinions with extreme caution.

(3) *Vividness of imagination* is requisite in order to form a conception of the march of events, for without this one cannot live in the times that are past. Unless the teacher is imaginative, he cannot possibly throw into his teaching that vividness of description which helps the child to live in the past. Even then it will be very difficult for the child to picture many of the incidents, as nothing at all similar has yet come within his knowledge of life.

(4) *Deep knowledge of human nature* will lead to the discovery of motives for actions. It must be remembered that history consists of "human" records. Deeds of heroism and patriotism help to develop the character of our children. Experience teaches that the surroundings and circumstances of the time affect the actions of individuals.

3. Aims of Historical Teaching.

(1) *To trace the progress of the nation in political and personal liberty.*

To the English a grand inheritance has been bequeathed, for we inhabit the "Land of Liberty". The blessings of our social and political life have been secured by miseries untold. The pages of history are blotted with error and are full of terrible warnings; but heroic deeds that saved a nation's freedom shine forth as bright examples for imitation should the necessity arise.

(2) *To trace the development of the social condition of the people.*

Times of peace bring prosperity; for, when disturbing influences are at rest, men's minds are employed on inventions and improvements; such periods are marked by growing skill in manufactures, in agriculture, and in commerce. All improvements in this direction add to the well-being of the people, and no better illustration of the truth of this can be required than the marvellous advance of the last fifty years.

(3) *To teach the love of all that is noble.*

"Lives of great men all remind us,
We can make our lives sublime."

Insight into noble lives inspires noble action and creates ideals of high achievement. The lives of the heroes and martyrs who lived and died to maintain the honour of the country, to secure freedom of religion, personal liberty and good government, when studied under proper direction, stimulate others to nobility of character, quickening the pulse of both old and young.

(4) *To lay the foundation for a knowledge of the rights and duties of citizenship.*

An account of the origin, constitution, and functions of a county council, or of the mode of electing members of any representative body, will be the easier to understand when learners have acquired a knowledge of the concrete facts of English history out of which our modern institutions have grown.

Experience teaches the value of men co-operating to accomplish some social object which one alone could not do. An intelligent, law-abiding people, with a knowledge of the value and significance of our free institutions, appreciate the privilege of participation in elections by ballot, trial by jury, and other safeguards of freedom.

Children some day will help to make history; for their votes will determine the political actions of this great country. The past leads up to and makes the present intelligible. School-life furnishes countless opportunities for observation and experiment in government, apart from the direct study of history which it often illustrates.

(5) *To foster the love of country.*

"Breathes there a man with soul so dead,
Who never to himself hath said,
This is my own, my native land?"

Love of home and love of country, sometimes called patriotism, are noble sentiments, and the human race is the better, happier, and nobler by their cultivation. A truly patriotic ardour induces industry, thrift, and a mind and heart open to the best moral teaching and influences.

Patriotism causes the heart to beat high at our country's glorious past and the pricelessness of our inheritance. This should teach us never to bring disgrace upon it.

(6) *To exercise the powers of judgment, comparison, and imagination.*

History is a subject which, whilst exciting many influences, affects character most; for from it moral influences emanate spontaneously, and affect and mould the character; but unless the intellectual faculties are duly exercised, the impressions will not be so fruitful or so enduring.

Under the direction of the teacher the scholar is taught to judge of present needs from the successes or failures of the past; to compare the past with the present and the present

with the past, so that by the aid of the imagination the one may illustrate and make clear the other. A keen analytical power is developed in the study of cause and effect, and in investigating the rise, progress, and fall of persons, movements, and even nations; so that profiting by experience we may be warned, and save ourselves and our land from disastrous results.

• 4. Aids to Teaching.

(1) *Previous preparation*.—It is of the utmost importance for the teacher to study the subject from the best text-books, and so to master the lesson that he may, as it were, be saturated with the matter in all its bearings. This would enable him to give a vivid and faithful description to the class. Careful preparation coupled with enthusiastic teaching will enable the teacher to excite the children's interest, because faith in what is taught shows itself in voice, face, and gesture, and this tells with great force. Further, the teacher having made the facts his own, will retail them in simple, short, telling sentences that will become the pattern for connected narrative, when the children are called upon to reproduce the lesson.

Thought must be given so to present a bald fact that it shall be received with more than a passing interest. For example, with a view to creating a sympathetic interest, in addition to the fact that Columbus discovered America in 1492, reference should be made to his poverty, his genius, his patience, his courage, his success, his chains, and his death; also to the fame attaching to his name as the one who, under what appeared insuperable difficulties, opened up a new path for civilization.

(2) *Summaries for the black-board*.—There is danger of a history lesson becoming a lecture. To avoid this the teacher must get the co-operation of the class by occasional questioning, thus leading them to suggest the probable results of actions, measures, &c. A sufficient summary must be written upon the black-board to form an abstract of the whole lesson. This will be learnt by heart, or provide the material for the composition exercise that may follow.

Memory of some dates and their relation to each other is an indispensable factor in understanding history; and as summaries should follow in sequence of time, it is advisable to rule off a column about twelve inches wide for a date-and-event ladder, while the rest of the board is used for grouping

facts. and making sketches. No date should be taught unless it is the symbol that will recall some event or period interesting to the pupil.

Coloured chalk may be usefully employed for impressing facts or dates: thus, 1066 may be written in red, and 1688 in white; one indicating a sanguinary event, and the other a peaceful revolution. Sketches of localities on the board are more effective than maps. At the conclusion of the lesson revision should take place, first with the summary in view and afterwards without its aid; but it should be preserved for reference and for composition exercises.

(3) *Use of maps.*—History and geography are inseparably connected. History cannot be understood without geography, which helps to explain and impress facts; and in the same way geography is more readily mastered when associated with some historical fact. A reference to the physical features shown by the map will oftentimes explain why invading hosts, or emigrants landed at certain spots, took a certain direction, fought battles, or formed settlements, where they did. All places should be pointed out on a map, and map-drawing adopted as explanatory of the history lesson. Relief-maps are specially serviceable.

(4) *Pictorial illustrations.*—Usually history books are well illustrated, but oral lessons demand a selection of striking pictures of sufficient size for the inspection of the class. Wall-prints, photographs of paintings, and the teacher's own portfolio should be freely used to supply portraits, views of towns, buildings, and landscapes, sports, dress, handicrafts, ships, hand-writing, &c.

(5) *Comparison with the past.*—The events of the present readily impress the memory, because they are acquired by a personal knowledge; therefore the teacher must aim at creating the nearest possible approach to such conditions in treating past history. This may be done in descriptive language, aided by pictures, and, where possible, by visits to the parts; by peopling, in imagination, towns and streets with the life of the past, and comparing and contrasting with the present. Ruins, curiosities in museums, national memorials in public thoroughfares, all lend themselves for comparison with the manners and customs of our forefathers. Names of towns, roads, &c., when rightly understood, call up facts of history. The historic Lord Mayor's Show is an object lesson in history when intelligently understood.

A lasting impression of historic fact must be made upon the mind of the child acquainted with the vastness of London, if, by realistic description, he is led to compare that mighty city of five million inhabitants with the clay-built huts that formerly stood on a piece of rising ground protected by a barren marsh and a dense forest.

Comparison with the past leads to the inference that history repeats itself. Even though the records may not be alike in every particular, still memory is assisted. To compare the chronology of events as presented in written numbers will also prove helpful, *e.g.* thus, 1215, 1415, 1815; 1066, 1422, 1688; 1213, 1314.

(6) *Connect cause and effect.*—Seek to trace events back to the circumstances which caused them to take place. Thus it will be found very interesting and instructive to account for the numerous incursions into these islands during the first ten centuries. Consider the difficulty the Norsemen had in the regions of the Baltic Sea to wring a living out of the rocky, stony soil, with short rainy summers and long cold winters. As the land did not yield food enough, the sea must be robbed of its treasures and ships plundered; other lands must be visited and plundered, as in the Saxon invasions. Rollo the pirate conquered Normandy, and his followers and successors, under the influence of sunny skies, lost their wilder propensities and built towns and churches, and practised the science of government. Later the ambition of William led to the conquest of England in 1066.

Other facts, including discoveries, reforms, inventions, give scope to this method of aiding historic memory.

(7) *Exercise the imagination.*—For a child to assume the character of an adult, and, in imagination, to live his life, especially in a bygone age, is extremely difficult; yet it is this which creates a lively interest in history. Assistance may be rendered by allowing children to represent actual characters, and then to act history. Scenes from an historical play are a great aid to the imagination. Let memorable sayings of the world's great actors be committed to memory; they ring in the ear, and we at once become as familiar with the incident as if it had happened in our presence. As an example, take the remarkable words of Gen. Wolfe, "I would rather be the author of that poem than take Quebec"; or Wolsey's at Leicester Abbey. The best history teaching consists largely of biography.

(8) *Recapitulation*.—Without frequent revision knowledge of history becomes hazy, and, therefore, next to useless. Constant retrospects should be made both orally and in writing. Knowledge can be refreshed by selected narratives from reading-books, and by reading passages from authors of historical repute. The scholars should be encouraged to read for themselves such books as *Harold*, *Ivanhoe*, and *Westward Ho!* and to commit to memory gems from the poets. Ballads not only create interest, but also make the knowledge permanent. History should be reviewed not only by means of the teacher's recapitulatory questions and through literature, but by constant reference to current events which can be made to bear on the past.

5. *Schemes of Instruction*.—As the aims to be kept in view are intellectual and moral, the best subjects will be those that will have the strongest influence over right action, either in the schoolroom, the home, or in public life. The *Instructions to H.M.I.* states:—

“Persons not especially distinguished, remote results, and mere lists of authors do not satisfy the requirements of any course. A syllabus should deal with principal events, leading characters, and notable changes both social and political, as, for example, the broad features and bearings of such a notable institution as the Feudal System.”

Reference to Schedule II. will supply material for a detailed syllabus, so that it will be sufficient here to note the principles underlying the lists of lessons. For the younger children it will be observed that a general acquaintance with the facts of history is provided for by simple stories. No better provision could be made for creating a taste for the subject if the teacher make a wise selection of topics, and become an expert storyteller.

“Where to begin?” will be a question to be met. Well, begin with what appeals most directly to the child. The starting-point may, perhaps, be suggested either by local sites or buildings, by anniversaries (as Gunpowder Plot), or by current events. Then widening out, endeavour to follow out a chain of events as nearly as possible in chronological order, such as will interest the children.

The prepared list of lessons should be chronologically arranged, but the first lesson given need not be the first on the list. Clothe the incident or character with everything that

will appeal to the young imagination; cultivate the sentiments of pity, justice, and toleration, and implant a hatred of war and a love of peace.

For the middle stages the topics are selected first up to 1485, then to 1688, and then to the present time, embracing in each section principal events, leading characters, and notable changes, both social and political, all ostensibly with a view to oral instruction and not text-book study.

For the senior stages there are two sections, indicating that the story-telling stage is mainly past, and that history is to be regarded more as a study, now that we are dealing with maturer minds.

Before leaving these schemes we will give a list of simple stories for the lower grade only (as lists are suggested in the schedules for the middle grade), and we will follow these by hints as to how to treat a period for the senior grade.

6. List of Simple Stories.—1. Ancient Britons. 2. Hengist and Horsa. 3. Canute and the Flatterers. 4. Rollo of Normandy. 5. Walter Tyrrel. 6. The Wreck of the White Ship. 7. Cœur de Lion. 8. Prince Arthur. 9. Prince Edward's escape from Simon de Montfort. 10. The First Prince of Wales. 11. Queen Phillipa and the Citizens of Calais. 12. Wat Tyler. 13. Madcap Harry and the Judge. 14. Henry V. and the Crown. 15. Queen Margaret and the Robbers. 16. The Princes in the Tower. 17. Columbus discovers a New Land. 18. Lady Jane Grey. 19. The Ring given to Essex. 20. Gunpowder Plot. 21. The Royal Oak. 22. Great Fire of London. 23. Queen Victoria's Jubilee.

Stories such as these, when faithfully related, will not only amuse but will also awaken historic interest, and be conducive to further and more substantial improvement. Outline notes will suffice for formal preparation.

7. How to Outline a Period.—First treat a period generally as to its scope and main characteristics, then impress the events that distinguish it from other periods; and from this general treatment proceed to unfold in detail the features of interest, grouping them according to their nature in chronological order, and completing events of the same kind in a period before taking up different events. Let the "Reigns" be the opportunities for recapitulation.

A. The Tudor Period.

(1) *A glance at the new dynasty*—its origin, its duration, and its power.

(2) *The Tudor family*—its descent, its representatives, and their characteristics.

(3) *Distinguishing features*.—A period marked by religious changes (Reformation), Marian persecutions, and the Armada.

(4) *The Reformation*—immediate cause, occurrences, and effects.

(5) *Religious persecutions*—reconciliation with Rome; actors and sufferers; effects.

(6) *The Armada*—its causes, incidents, and results.

(7) *Internal administration*.—Money obtained by loans and benevolences; war supplies misappropriated; monopolies granted. Functions of Star Chamber and High Commission Court.

(8) *Internal disturbances*.—Unpopularity of Henry VII. led to impostors; suppression of monasteries led to pilgrimage of grace; general distress to Ket's insurrection, and eventually to the death of the Duke of Somerset.

(9) *Internal disturbances*.—Northumberland's ambition led to the death of Lady Jane Grey and himself; Mary's Spanish Alliance to Wyatt's rebellion; Elizabeth's jealousy of Mary Queen of Scots to Babington and other plots.

(10) *Foreign policy*.—Henry VII. and France; Henry VIII. and the Italian League; battles of Spurs and Flodden.

(11) *Foreign policy*.—Wolsey's diplomacy; Field of Cloth of Gold; war with Spain.

(12) *Maritime enterprise*.—Discovery of America; Cape of Good Hope; voyage round the world; settlement of Virginia; Columbus, Cabot di Gama, Drake, Raleigh.

(13) *Revival of letters*.—Henry VIII. a scholar, "Defender of the Faith"; translation of the Bible; founding University Colleges; Edward VI.'s prayer-book; grammar schools.

(14) *Writers and their works*.—"Elizabethan Period" of English literature—Bacon, Shakspeare, Spenser.

(15) *Life of Wolsey*.—His learning, preferments, intrigues, and fall.

(16) *Doings of Somerset the Protector*.—Attempt to force the marriage of Edward VI. and Mary of Scotland; arrogant treatment of nobles; complicity in rebellion; beheaded in the Tower; Somerset House.

(17) *Lady Jane Grey*.—Northumberland's ambition; intrigues and fall; imprisonment and execution.

(18) *Mary, Queen of Scots*.—Descent; misfortunes; death. Tomb in Westminster Abbey.

(19) *Life of Henry VII.*—Early associations; accession; plots; exactions; maritime discoveries; conditions of living among the people.

(20) *Life of Henry VIII.*—Succession; marriages and family; social changes; Wolsey, More, and Fisher.

(21) *Life of Henry VIII.*—Foreign relations; general effect of the reign.

(22) *Life of Edward VI.*—Pious character; influence of Somerset and Northumberland; founding grammar schools.

(23) *Life of Mary.*—Early training; influences; Bonner and Gardiner; loss of Calais.

(24) *Life of Elizabeth.*—Conditions at accession; progress of literature; Cecil; national patriotism; success and gratitude; maritime and commercial enterprise; effect of her reign.

(25) *A retrospect.*—Rather more than a century of strong personal government; people growing in power; improved architecture; advance in learning; institution of schools; religious intolerance; royal usurpations; naval supremacy established.

B. Long Periods.—Supposing the period for study includes several family dynasties, the families could be taken in order in less detail; or periods of a century or 250 years could be chosen. In such a scheme, if centuries be chosen each should be characterized; for example, the sixteenth century as a period of development of religious liberty; the seventeenth, development of civil liberty; the eighteenth, development of colonial empire. If periods of 250 years, it will be found that such landmarks as the following will be suggestive:—250, Roman government; 500, Saxon power; 750, general spread of Christianity; 1000, Norman influence; 1250, House of Commons; 1500, Reformation; 1750, Hanoverians.

Any plan is better than the ordinary text-book method of proceeding reign by reign.

8. PREPARATION OF TEACHING NOTES.

A. A Simple Story.

OUTLINE NOTES ON

THE JUBILEE OF QUEEN VICTORIA.

Class—Junior Division.

Time—30 minutes.

Aim—To train children in looking backwards; in this instance, as far as infancy or thereabouts.

Illustrations.—Pictures of celebrations; the Queen and Royal Family; any public memorial; coins; medal; map.

(1) *School children's rejoicings*.—Relate personal experiences of festivities provided for school children—local and general. Show a picture of school children in Hyde Park, London, and also one of the Queen. Refer to these scenes and occurrences as happening when most were babies.

(2) *Public ceremonies*.—Picture of any local procession and description of the same, including decorations, illuminations, fireworks, &c.—(a) local, (b) national. Show picture of Westminster Abbey and public processions. Refer to presence of notable persons—kings, princes, &c., from other lands. Use the picture of the Royal Family; point out on map places whence foreign princes came.

(3) *Public memorials*.—Refer to any local memorial erected in 1887, as drinking fountains, public buildings, &c. Show mementoes, as coins, medals, jubilee cup (to London children), &c.

(4) *Cause and effect*.—Tell of the progress in social matters during the past fifty years—penny post, telegraphs, lighting, police, education, general happiness and comfort. Show that the congratulations emphasize to the world the happiness and progress of the people, and their love for their queen and country, as well as their contentment with institutions, &c.

BLACK-BOARD SUMMARY.

Boys and girls marched in procession, sang the National Anthem, had refreshments. London children saw the Queen in Hyde Park. The Queen attended a thanksgiving service in Westminster Abbey. Princes came from foreign lands. The dates on the public memorial are 1837 and 1887 (50 years). There have been great improvements in the post, the telegraph, the lighting, the travelling, the schools.

B. A Biography.—The middle and upper divisions can well

be made acquainted with the lives of great men who have been the "shaping instruments" in great movements; and, remembering that "lives are the mirrors by which we see ourselves, and regulate our conduct", it should not be difficult to decide upon the aim or purpose of the selected lesson. The points to be noted in logical order are—(a) Parentage and early training; (b) Surrounding opportunities and influences; (c) Works: their kind and nature, (d) Character and influence. But the order in which they should be taken would vary with time and circumstances. For example, in presenting *Thomas à Becket* it would excite interest to treat first of all the incident at Canterbury; *Thomas Wolsey*, the difficulties of Henry VIII.; *Nelson*, the Battle of Trafalgar; *Florence Nightingale*, the suffering soldiers in the Crimea. Then, again, in some instances it would be very appropriate to commence the lesson with reference to some local circumstance, or an anniversary.

C. Legislative Reform.—This would be the type to include municipal and social changes, parliamentary enactments, treaties with foreign states, &c. Generally such subjects could be presented thus:—

(1) *Origin, or conditions leading to the changes.*—Here would be noted, in the cases of the several *Reform Bills*, the inequality of representative and voting power owing to the removal of population due to the exigences of work; in the case of the *Education Act*, the serious neglect of schooling among the people; in the case of a *Treaty*, the matter in dispute, owing to national or trade jealousies.

(2) *The efforts to obtain the change (or treaty).*—Note the evidences of dissatisfaction as shown in public meetings, newspapers, and disturbances. Distinguish the leading spirits, and trace their actions when controlling combined movements to form, perpetuate, or improve governments and social conditions.

(3) *The main provisions.*—Unnecessary details to be omitted, and, as a rule, only three or four provisions to be placed on the black-board, to be committed to memory, e.g. *Magna Charta*: (1) No freeman shall be imprisoned without proper trial; (2) To none will we sell, deny, or delay right or justice; (3) No taxes shall be imposed without the consent of the National Council.

(4) *The general results.*—Show that the various decisions removed the evils of discontent, ignorance, or despotism, and provided for happiness, progress, and peace.

D. A War, including such struggles as the American War of Independence, the Crusades, a battle.

(1) *The origin*.—Trace the causes, whether political, commercial, or personal. Examine the motives which prevented a settlement. Show how arbitration failed to solve the difficulties. Exercise judgment in apportioning the blame for disturbance of the peace.

(2) *The seat of war*.—Follow the route of the foes. Use maps and make sketches on the black-board. A relief-map or sand-model of the seat of war is very useful. Note positions of contending forces.

(3) *Remarkable events and leaders*.—Impress incidents by description. Note any extraordinary deeds of bravery. Give the names of leaders. Dwell in due proportion upon the sufferings, privations, and heroic deeds.

(4) *Results*.—Both sides expended lives and treasure. Both sides became the poorer. Grief and distress on both sides, particularly at the seat of war, where trade and commerce have been at a stand-still. Note increase of territory, power, and debt. Observe that war is a grim necessity; but the glories of war do not outweigh the horrors, therefore it should be a last resource.

OUTLINE NOTES ON THE INVINCIBLE ARMADA.

Class—Upper Division.

Time—40 minutes.

Aim.—To show how love of country united a brave people in defence of hearth and home.

Illustrations.—Map of the world; sketch map of the West of Europe, including the British Isles; relief model of English Channel; pictures of heroes, ships, &c.

(1) *The cause*.—Refer to Spanish Inquisition. Show how English volunteers went to the Netherlands. Philip of Spain wished to marry Elizabeth; he also wished the power of the Pope to be restored in England.

(2) *Preparations*.—(a) For invasion—Spanish power and revenues very great; no money or pains spared to be invincible. Enormous ships built, equipped, and manned. Leaders—Dukes of Parma and Sidonia.

(b) For defence—Catholics united with Protestants. All seaports supplied ships. Queen Elizabeth gave personal en-

couragement. Show picture of Tilbury Fort. Note the leaders—Howard, Drake, Frobisher, and Hawkins. Show picture and relate story of the heroes on Plymouth Hoe.

(3) *Voyage of the Armada*.—Mark Lisbon and Corunna on sketch map. Give date, May 29, 1588. Mark on the model the Armada going up the Channel. Tell of the fire-signals, and refer to, or promise to read, "The Armada". Show on the model how small ships attacked the big ones. Explain the use of fire-ships. Follow on the map the flight, and tell the destruction by the storm.

(4) *Results*.—Peace at home, and religious tolerance now assured. Show picture of public thanksgiving at St. Paul's Cathedral. Explain the effects of England's naval superiority.

BLACK-BOARD SUMMARY.

Philip II. of Spain wished (a) to revenge the aid given to the Netherlands.

(b) to marry Elizabeth.

(c) to re-establish the power of the Pope.

The Spaniards built an enormous fleet, and employed skilful leaders—Dukes of Parma and Sidonia.

The whole English nation was aroused and personally encouraged by Elizabeth. Howard, Drake, Frobisher, Hawkins were the leaders.

1588.—Protestantism safe. England's naval supremacy assured.

E. A Reign.—The notes may embrace *some* of the following divisions, and the aim may be to teach how the characteristics of the king, and the events of his life, affected the progress and happiness of the times.

(1) *Parentage, early life, and accession*.—Here include notes on early surroundings, and their influence upon character; also the general conditions at the time of accession.

(2) *Memorable events*.—Classify as social, religious, political. Specify changes in the laws, advance in manufactures, progress of literature, and results of wars.

(3) *Remarkable men*.—Indicate those who have made their mark as politicians, social reformers, generals, admirals, inventors, writers, and ecclesiastics.

(4) *Character of the reign*.—Taking a general survey by way of recapitulation, compare the condition of the country at the close with the beginning. As an application, point out the evils of despotism, war, &c., and the blessings of peace.

SUMMARY.

1. A right training in history is a preparation for citizenship. History repeats itself, and past events are guides to the future.

2. To become a successful teacher of history an intelligent acquaintance with the facts and conditions of life must supplement book study. History has a moral as well as intellectual purpose. Teach children to recognize the growth, progress, and development of the nation, to admire the noble deeds and self-sacrifice of the leaders of the people, to love their country, and to be proud to share in its government.

3. Preparation ensures an accurate knowledge on the teacher's part, and makes a successful lesson.

4. A scheme of lessons should treat of principal events, leading characters, and notable changes. Simple stories are adapted to the junior divisions, stories and biographies to the middle divisions, and periods to the upper divisions.

5. The simple story must contain historic fact, and instruct as well as amuse. The list should be in chronological order.

6. First treat of the scope and main characteristics of the period, and secondly of the events which distinguished it from all others. Facts similar in nature should then be taken up in chronological order.

7. Outline notes should show that the method of procedure has been decided upon, and that matter and illustrations have been prepared. "The Early Life" is not always the best way to begin a biography.

8. Use black-board summaries as analyses for composition.

GOVERNMENT QUESTIONS.

1. Show the use of ballad poetry in the teaching of history, and illustrate your statement by some historical ballad.

2. Write out the chief topics to be selected for a lesson on the reign of one of the kings of England, and expand one of these topics into brief notes of a lesson.

3. What plan would you follow in giving a description of some famous battle? Illustrate your answer by the battle of Flodden or Waterloo.

4. Select points in the character of Lady Jane Grey, or Robert Bruce, or Nelson, that would be especially attractive to children, and write out some anecdote by which you would illustrate each point.

5. Write out those dates of events in English history during the seventh century which you consider worthy of being committed to memory by children, and give reasons for your selection.

6. Name some stories from English history that you have found to be most attractive to young children, and explain simply the causes of their attractiveness.

7. Explain what may be done by the help of reading to impart historical information in schools in which history is not taken as a class subject.

8. The earliest lessons in history for young people should be anecdotal and biographical. Give reasons for this recommendation, and mention a few leading incidents in English history which you think might be usefully narrated to learners before their regular chronological study of English history begins.

9. In giving a lesson on the Duke of Wellington, show what use you would make of comparison and contrast with any other character in history.

10. In teaching history, say what use, if any, you would make of chronological tables. Is it better to learn the date before or after the pupil knows something of an event, and becomes interested in it? Give your reasons.

11. Show, by giving a short sketch in each case, the different points you would bring into prominence in giving a lesson on Alfred the Great to children in the lowest class, and in the highest class of a school.

12. Construct a list of stories and biographies to cover the period from 1066 to 1485.

CHAPTER XVIII.—ELEMENTARY SCIENCE.

1. Importance of the Study.—Already it is the experience of organizers and teachers of Polytechnic Classes that the students, whether artisans or not, have not sufficient acquaintance with the elementary principles underlying the peculiar work in which they are interested; hence they are not capable of benefiting, to the fullest extent, by the scientific instruction provided for them. To remedy this defect, it is essential that the school curriculum should include lessons which shall lead up to a regular study of natural history and physics, by presenting in orderly sequence objects and experiments for observation and study, from which the most elementary laws of nature may be deduced.

In this way a stable foundation for future improvement will be laid, and scholars made fit and willing to avail themselves of the opportunities afforded by Polytechnic and kindred institutions. Such lessons not unfrequently show the natural aptitude of a child, and indicate his future career. The attempt often made to reproduce at home the experiment seen, leads to deftness of hand, and stimulates the inventive faculty.

Whether or not the child enters the labour market is immaterial; the mental training the study affords is in itself of the greatest value.

2. Aids to Successful Teaching.

(1) *Experiments.*—These should be prepared and worked beforehand to ensure success. When trying an experiment the results should be duly recorded, so that when working before the class the children may be directed in their observations in accordance with the order of the discoveries. Whenever practicable, let the children perform the experiments.

(2) *Models*.—Next to the real object an accurate representation is the best, provided it is large enough for all the class to examine.

(3) *Home-made apparatus*.—This is not to displace the large and accurate model, but is intended to appeal to the inventiveness and handiness of the children, and to impress the principles of construction; or the principles the apparatus is designed to teach. Both teachers and pupils should co-operate in this work.

(4) *Specimens*.—Sometimes it is convenient to have sufficient to distribute about the class for the children to examine, but if the specimens are very large this is not necessary.

(5) *Pictures*.—Although usually attractive, and occasionally forming useful substitutes, definite scientific principles cannot possibly be elucidated solely by their aid. If used at all they must be good, and specially adapted for their purpose.

(6) *Diagrams*.—As a rule these are of more service than pictures. They must be correctly drawn, either before the lesson or in view of the class. Coloured crayons assist in marking the distinctive features.

(7) *Reading books*.—These must *succeed*, not *precede* the oral work. Thorough recapitulation is easier and more effective when they are used. Greater definiteness is given to the teaching, as well as a new interest imparted to the subject.

(8) *Museums and art galleries*.—A very great importance attaches to visits paid, under proper conditions, to educational institutes.

(a) The visit must have a precise *object* in view. It should be prepared for by the teacher's thorough study of the catalogue, so that no time may be lost in finding the object or objects sought, and by the supply of brief notes to each child about the object of research. These of course will be necessary, because a number of lessons, and not one only, showed the visit to be desirable.

(b) *The number of scholars* must be limited. As the pupils are seeking knowledge rather than amusement, it is evident that some fifteen or twenty scholars are enough for one teacher to control.

(c) *The number of visits* must be limited. Correct registration must be ensured, and not more than twenty such attendances in a year are permissible. The times chosen should have regard to the convenience of the general public and of students, in order to avoid distraction and disturbance to the pupils.

(d) *Records* should be kept for reference. From their own

observations the children should test the information contained in their notes, and if possible add to it. On returning to school they should be encouraged to ask further questions, and exercised in drawing, writing, or otherwise describing what they observed. The teacher also should make notes for future visits.

(9) *Peripatetic teachers*.—Specialists in given subjects render much assistance, particularly in performing experiments; but as a rule they must be regarded only as demonstrators of what to teach and how to teach it. The teacher must therefore be prepared to supplement and crystallize the lessons. The skilled demonstrator may be usefully employed with one class, or classes may be collected for the purpose.

(10) *Newspapers and magazines*.—Anything that impresses the practical and public importance of a school lesson is of great value. Hence the reading of suitable articles on new discoveries and advance in science, or papers on scientific subjects popularly treated, such as are to be found in certain magazines, is highly appreciated.

3. General Methods of Teaching.—*The Instructions to H.M.I.* says—"Teaching of science which consists in learning definitions or numerical calculations by heart is especially to be avoided. The examination should be directed entirely to illustrations and experiments showing that the terms that have been employed and the natural laws that have been taught are fully grasped."

Experiments.—Close observation, under the direction of the teacher, of experiments and other modes of illustration should lead to the discovery of natural laws. Verbal description, instead of the exercise of the powers of observation, is worthless as a means of education. Let the children take part in the experiments.

Results of investigations.—Make the children express in their own words the ideas they have formed, accepting answers in complete sentences, or if made with reasonable fulness. It is well to train the children to express their meaning by sketches or drawings on black-board or paper, thus testing the accuracy of their knowledge by graphic and oral expression side by side.

Scientific terms.—With younger children popular terms, although sometimes perhaps ambiguous and misleading, are more suitable; but with the elder children the scientific term is advisable, as it is the only positive means of identification.

The long words have a somewhat deterring effect unless explained by their etymology, which renders them much easier. Botany is studied by all civilized nations, and the objects can usually be recognized by their scientific names; but popular names are not the same.

4. Object Lessons *versus* Elementary Science.—In the former it is customary to present the whole for investigation, following this with a description of the parts; in the latter, the properties of parts are discovered, and from these the whole is built up. The latter method is synthetic, the former is analytic. The conversational object lessons in the lower division of a school lead up to a more systematic study of the principles of science in the upper, and so complete the chain of investigation.

5. Schemes of Science Instruction.—The choice of subjects is very wide, and provided the scheme ensures a high standard of effort, accuracy, intelligence, and practical usefulness, “my Lords wish to leave to managers and teachers entire freedom in regard both to the selection and arrangement of topics, and to the methods employed in their treatment and illustration” (*Instructions to H.M.I.*).

A scheme which is well graduated, suitable to the age of the scholars, and deals with the facts and materials of the outer world, is essentially one that will fulfil its purpose under proper treatment. In the schedules of the Education Code the lessons suggested come under one or more of the following:—(a) Chief tribes of animals and their habits. (b) Common plants and their growth. (c) Common inorganic substances and their properties. (d) Simple mechanical laws in their application to common life and industries. (e) Pressure of liquids and gases. (f) Simple chemical laws in their application to common life and industries. (g) Outlines of physiology in its bearing on health and work. (h) Familiar illustrations of applied science.

Particular attention should be directed to the progressive courses of lessons in the Supplement to Schedule II., where the entire school course is identified with one stated science subject. The student should make himself fully acquainted with the lessons mentioned, as from these the selection is naturally made when notes of lessons are required at an examination. They, therefore, not only suggest and form the models for schemes, but indicate a line of reading which will

enable the teacher to meet the request for teaching notes with some measure of confidence.

SUMMARY.

1. Elementary science lessons provide valuable mental training, as well as a means for self-improvement leading to success in work.
2. Success is achieved through experimental work and close observation.
3. The precise object of a visit to a museum should be clearly defined and carefully prepared for; the number of scholars should be limited, and a convenient time selected.
4. The results of experiments and other investigations need to be closely watched and accurately recorded step by step.
5. Schemes may be found in Schedule II. and among "Specifics".

CHAPTER XIX.—MUSIC.

1. Introduction.—A quarter of a century since, a Minute of the Committee of Council on Education contained the following interesting remarks:—

"Though vocal music has hitherto been comparatively neglected in the elementary schools, there is sufficient evidence that the natural genius of the people would reward a careful cultivation. In the northern counties of England choral singing has long formed the chief rational amusement of the manufacturing population. The weavers of Lancashire and Yorkshire have been famed for their acquaintance with the great works of Handel and Haydn, with the part music of the Old English School, and those admirable old English songs, the music of which it is desirable to restore to common use.

"The agricultural population of Norfolk, in like manner, has shown taste in the cultivation of vocal music, and has rendered service in the production of oratorios sung at the festivals for which Norwich has been celebrated. Similar evidences of the native genius of the people are scattered over different parts of England."

Since the above was written, and particularly during the past decade, enormous strides have been made in the public schools, stepping from the simple though tuneful song learnt by ear to the mastery of part songs learnt by note-reading, so that the absence of sight-singing is becoming the exception.

2. Advantages to be expected from a Musical Training in Schools.—(1) *It elevates character.*—Music has

a refining influence. The nobler emotions of hope, courage, affection, generosity, charity, kindness, sympathy, and devotion are cultivated and enhanced in degree, while the baser feelings of anger, envy, and hatred are banished. Confucius said: "Music gives the finish to the character".

(2) *A rational amusement is provided.*—The happiness of home life is increased where melody and harmony reign. People are weaned from vicious indulgences.

(3) *Health and vigour are promoted.*—The proper and regular exercise of the vocal organs is an important physical consideration. Deep, full inspirations increase the capacity and power of the lungs. John Ruskin said: "Singing as a gymnastic exercise is necessary to keep the body healthy; as an emotional exercise it is necessary to keep the soul healthy, and the proper nourishment of the intellect and the emotions can no more go on without music or singing than the proper functions of the stomach and the blood can go on without proper exercise".

(4) *Patriotism is fostered.*—The songs of nature, of bravery, of country tend to foster patriotism and teach loyalty, bravery, and industry. National songs rouse the spirits and touch the springs of memory and sympathy.

(5) *The mental faculties are quickened.*—Music-reading is an exercise in rapid thinking and prompt expression. The mental effort demanded for precision of movement, conception of pitch, and quality of tone, intensifies the powers of reasoning and judgment, and trains to habits of concentration and attention.

Thus it is evident that music forms a very important part in the physical, mental, and moral education of the child.

3. Songs.—These are said to be the index to the character of a nation; that is to say, the sentiments expressed in the words are characteristic of the people. The Education Department does not appear to have been quite satisfied of late with the songs chosen for school practice, and the complaint seems to have arisen from (a) unsuitable airs, (b) foolish words, (c) providing nothing for the improvement of taste; hence it will be well to understand the recognized *Conditions of Selection*.

(1) *Words should be such that children of the age can understand.*—A song associated with some previous lesson (*The Busy Bee*, *The River*) expressing the hopes of industry, or the comforts and contentment of household life (*Home, Sweet Home*), or preserving the traditions of a country's triumphs (*Men of Harlech*),

or inspiring confidence in her greatness and strength (*Rule, Britannia*), would be suitable, provided the language be understood. The embodiment in songs of national legends, &c., as a means of diffusing national sentiments, and thereby conducting to the promotion of the honour and prosperity of the country, is most laudable.

(2) *The words should be of a good standard character.*—Children's songs in order to be easy need not be mere doggerel. The very best poetic gems can be, and are, set to music. The airs should be such as will cultivate musical taste and feeling; hence both words and tune should be of a high standard in order to possess a refining and elevating influence.

(3) *The melodies should be the production of recognized composers.*—To satisfy this condition is not at present easy. Great composers have not written for schools, as the demand for this class of work is so recent. However, considerable freedom of choice is admitted as long as the melodies are of a high character.

(4) *The music should be within the limited range of voice.*—Any music which can only be produced by forcing the upper or lower notes is productive of mischief to the vocal organs, and yields no pleasure to the performer or listener. The class songs are for the average child, not for the specially gifted.

(5) *A limited number should receive special preparation.*—To ensure this a minimum is prescribed for the several divisions. Thus—

First division (Infants), three songs to be sung sweetly.

Second „ (Junior), five songs to be sung in unison, in good time and tune, and sweetly.

Third „ (Middle), five songs as above with due expression.

Fourth „ (Senior), five songs in two or more parts with due expression and pleasing quality of voice.

These songs should not be reserved for the music lesson, but should form a pleasing change at certain intervals of the day.

4. How to Teach Songs.

(1) By Ear—

(a) Write the words on the black-board, and recite them to ensure that the meaning is understood, and to enlist sympathy with any sentiments expressed.

(b) Let the children repeat the words after the teacher in an expressive, pleasing, and rhythmic tone of voice.

(c) The teacher sings the whole verse that the children may catch its beauty.

(d) The teacher sings a phrase and the children imitate.

Do not sing *with* the class while teaching. See that each phrase is correctly rendered. Watch the mouths and the breathing. Cultivate the best taste. Allow no shouting.

(e) Place in the front row children musically deficient. Let them listen for a time, and then give private help.

(f) Sometimes silence the leading voices to ensure the self-reliance of the class.

(g) Invite a scholar to sing the song by himself or herself.

(2) When Singing is Taught by Note—

(a) Prepare the notes and the words on the black-board.

(b) Enlist interest in the sentiment of the song by reference to the words.

(c) Sing the song through in your best style.

(d) Read it in time (*monotone*) to ensure rhythm.

(e) Sol-fa a phrase and let the class imitate, looking at the music.

It is better to pattern each phrase, for learning a song should be made easy and rapid when it is not an exercise in "singing at sight". Make the work pleasant, not laborious. When difficulties in imitating phrases arise, use the modulator. Exercise vigilance over voice production.

(f) Sing the whole to "laa" and afterwards to words, while the teacher points to the music on the black-board.

(g) Encourage individual singers. As the band of volunteers increases, shyness will wear off and children will sing alone, just as they read alone.

Whether taught by note or by ear the time should always be beaten, and the teacher be so well acquainted with the song that he can give his entire attention to the class.

5. How to teach "Reading-at-Sight".

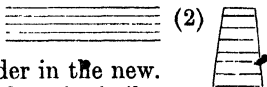
(1) Two Systems—

The two systems in vogue are the **Staff Notation** and the **Tonic Sol-fa**. The former is the older, and the one in common use for instrumental music; while the latter has become very popular for beginners. Two half-hour lessons per week will produce better results than one long lesson. Both systems

can be similarly taught except for the changes in the nomenclature, and in the illustrative chart or black-board work.

(a) Voice and ear practices are precisely the same in every particular.

(b) The modulator is only altered in construction; parallel lines are used in the old system, and a ladder in the new. When the movable Doh is employed there is similar work for either the staff modulator or "ladder" modulator, provided the symbols are understood. In (1) call any line or space Doh and exercise as with (2).



(c) The time signs in both systems want careful study.

The upper classes soon learn the Staff signs, and readily acquire proficiency in reading, if intelligent teaching has been given in the Tonic Sol-fa system.

(2) Plan of a Lesson—

(a) *Voice exercises.*—The beginning of every lesson should be occupied in producing good tone. The children must sit or stand upright, open their mouths freely, and breathe fully. Such syllables as *koo, oo, oh, laa, ah, ay, aw, ec.* can be usefully employed, and sung slowly at first, but afterwards quickening, up or down the scale or chords in varying keys. The teacher must detect dental, nasal, or throaty sounds, and secure purity of tone by giving strict attention to the vowel sounds, and to correct pitch.

(b) *Modulator exercises.*—Previous preparation by the teacher is advisable to prevent repetition, and ensure special and progressive instruction. The danger is that the teacher will work in a groove and keep to a few particular successions of tones. To avoid this, either draw up a series of graded exercises or use a published Progressive Course.

The several steps of progress are: the Doh chord in any order; tones of the scale in stepwise succession; Doh and Soh chords introducing Fah and Lah; tones in any order introducing Fe and Ta; exercises containing transitions of one, two, or three removes; and exercises in the minor mode and chromatic tones.

(c) *Time and tune exercises.*—Use charts or write passages on the black-board. Time and tune can be taught separately, but they should not be disconnected absolutely.

a. Elicit name of the time, and the reason.

- b. Let the class monotone one, two, or three bars, giving the beats.
- c. Point to chart or black-board, and monotone either to time names or sol-fa names or to "laa".
- d. Combine time and tune.
- e. Encourage individual performers.

(d) *Ear-training*.—The mental effects of tones have their use, but more progress is made when modulator exercises to "laa" are very frequent. Learning the sol-fa of well-known short tunes is a useful aid. Exercises in time must not be forgotten; recite short passages and get the description from the class.

(e) *Theory and songs*.—Questions on theory during the progress of the lesson. Finish the lesson with an enjoyable song.

SUMMARY.

1. The educative value of music is threefold—moral in refining character, physical in improving health, and intellectual in the demands it makes upon attention and memory.

2. Songs may be used to emphasize instruction, to stimulate right desires, to inculcate patriotism, and to provide amusement, pleasure, and recreation. They should be suitable in tune and words. Learning songs should be made a pleasurable exercise.

3. Correct time, tune, and vocalization can only be ensured when the teacher is free to watch the class. Create emulation by inviting individual performances.

4. The Tonic Sol-fa system is easy for beginners. It forms a good foundation for the Staff Notation. The upper classes should learn both.

GOVERNMENT QUESTIONS.

1. Describe the best method of proceeding in teaching a new song to infants or to older children.

2. Describe the method you adopt in teaching "singing by note" to a class of beginners.

3. What does the "modulator" represent, and what use is made of it in the Tonic Sol-fa method?

CHAPTER XX.—HAND AND EYE TRAINING.

1. *Its Importance*.—A child cannot be said to be trained for industrial work unless the *eye* is taught to discern minutely and the *hand* to execute accurately. He must be prepared for useful work; and to this end we must give him the opportunity

of discovering his natural bent. Moreover, it is essential to inculcate correct ideas regarding the dignity of labour, especially of manual labour. All creative work advances self-effort, and is a guide to the most suitable vocation. Since the apprenticeship system has all but disappeared, it is more necessary than ever to give this hand and eye training in order to develop that correctness of eye and deftness of hand which increase the capability for new tasks under new conditions. In recent times suitable provision has been made for infants by kindergarten exercises, and for the upper classes by some form of technical training, but the link between them has been overlooked until the immediate present.

Experience so far has shown that manual work has a useful reflex influence on all the ordinary subjects of instruction.

2. Advantages Claimed for Manual Training.

(1) **Physical.** (a) *The eye and the hand are trained to their best use.* The eye observes and the hand imitates, either on paper or in material.

(b) *The body is strengthened.* The power of the muscles is increased, and there is healthy exercise for the whole body. Thus the constitution is invigorated, and the brain relieved from the strain of ordinary lessons.

(c) *Aptitude and handiness are created.* This enforces love for work, because whatever we can do with ease gives enjoyment.

(2) **Mental.** (a) *The brain is stimulated to habits of attention.* A demand for expression, either on paper or in material, necessitates attention to details, and thus the critical faculty is developed.

(b) *The intelligence is quickened.* Diversity of employment increases brightness, gives zest to labour, and increases interest.

(c) *Knowledge is made definite and precise.* Exact notions of form, size, mass, and hardness have to be instilled, and exact calculations in geometry and practical arithmetic must be employed.

(3) **Moral.** (a) *A love for work is created.* Our "do-nothings" have a contempt for hand work, and vice, intemperance, and crime result.

(b) *The dignity of labour is advanced.* The growing common sense of the child teaches him that anything done the right way, with a right motive, is of much value, and worthy to be regarded highly.

(c) *The love of order and neatness is inculcated.* Experience teaches the child that slovenly and careless habits of work entail additional toil, and that it is best to be particular in all respects.

(d) *Self-reliance is stimulated.* Persistent efforts to make forms, being rewarded by success, train the will and give satisfaction to the mind.

3. Subjects of Instruction.—It may be said their number is legion; for day by day some fresh device or other is being put forward as a means to the end in view, and therefore the choice is very wide. First and foremost, however, stands Drawing. Among subjects of instruction satisfying “Other Occupations and Manual Training” are:—Cutting out and inventing paper patterns, modelling in clay and cardboard, weighing and measuring, the use of simple tools, wood-work, and metal work.

Subjects that are being universally adopted are Needlework, Cookery, Laundry, and Housewifery.

A. Freehand Drawing, that is drawing without any mechanical aids. All children should be encouraged to draw spontaneously from the object itself or from memory, freely and with confidence, relying upon the sympathy of the teacher, who will consider general form in these first attempts rather than accuracy of detail, otherwise the innate love for drawing will be strangled.

In all attempts, whether from objects, memory, or copies, aim at ease and quickness of execution, and accept a fair degree of accuracy.

The teacher should frequently draw in the presence of the class. He should be qualified to draw any object presented to the eye, and if he can draw from memory such objects as trees and animals he will find many imitators the more expert he shows himself to be.

(1) First Stage of Freehand Drawing.—In these lessons are taught lines, angles, parallels, and the simplest right-lined forms, drawn either on the black-board, slates, or paper. The order of lessons may be: 1. *One line*, in different directions, as upright, lying-down, and slanting; divisions proportionally and exactly measured. 2. *Two lines*, parallel and the same length; parallel in unequal lengths; crossing lines and angles. 3. *Three lines*, similar exercises and also triangles. 4. *Four lines*, similar exercises and also figures—the square and oblong.

Each lesson may be treated more or less as directed below.

(a) *Eye-training*.—The teacher holds a stick in an upright, horizontal, or oblique position. Children hold their pencils similarly. Children point to any corresponding lines in the room, such as corners, edges of doors, edges of the window-frames or tables, the lines on the flooring or wainscot, the slope of the edge of the desk, or map cords. When pointing, name the direction of the line.

Similarly judge, point out, and name divisions as one-half, one-quarter, one-third. Ask children to point to half the height of an upright edge, and so on. In measurements, twelve inches will suffice at this stage. Teacher and pupils apply a twelve-inch rule to the slate, paper, or desk. Exercise them in judging six inches, three inches, one inch, &c. Measure the pencil, &c. Work somewhat similarly with two, three, and four lines and their combinations, taking care that the inspection of the counterpart of every proposed drawing should be available either in parts of the room or in objects, for flat copy drawings are meaningless without illustration.

(b) *Hand-training*.—A complete flat copy should be before the class, either on the black-board or chart, as the drawing of the parts can have but little interest unless the whole can be seen. The teacher draws a line, or asks a child to do so, on the black-board. The first line is of immense importance; all others will be relative to it. Children criticise the lines as they are drawn; then correct before rubbing off inaccuracies. The class should now be in working order for drawing:—sit upright before the slate or paper; hold the pencil lightly, so that wrist and fingers are free; light sweeping touches to be attempted with the pencil; pretend at first, then when confident of the proper direction let the pencil glide along. The children can help one another by criticisms while the teacher draws attention to the successful attempts. Secure lines sufficiently strong to show the forms with clearness.

(c) *Application*.—Children to draw lines as dictated and answer questions on the forms made. Draw from memory any object made of similar lines. Teacher selects the best copy and draws the same or another in an altered form on the black-board. Show the “repetition” of simple forms in designs for tiles, paper, letters, &c.

(2) **Second Stage of Freehand Drawing**.—Bold curves will have been the outcome of much of the memory drawing in the

first stage, as curves are the first lines drawn by children when drawing for pleasure. Too much straight-lined work is undesirable, because it is apt to disgust the beginner; whereas graceful curve drawing is attractive.

In order to teach successfully the freehand drawing of regular forms and curved figures, in addition to the previous materials, it is necessary to provide rings, hoops, ellipses; charts showing the pentagon, hexagon, and octagon, or the models themselves; leaves and other curved forms.

(a) *Eye-training*.—Touch assists sight; so when the object is exhibited for criticism or investigation, allow it to be handled. If a flat copy be provided it should be traced, under direction, with a pointer. The regular figures should be formed with sticks or papers that have been distributed to the class. Examine the faces of models and compare the lengths of lines and the size of the angles. Show any objects in nature containing the curves to be taught. Trace in the pattern any objects of nature that have been adapted or conventionalized.

(b) *Hand-training*.—It is assumed that, in the first stage sufficient practice was given in drawing free and bold curves; now the regular work will proceed in order, but encouragement should still be given to memory drawing.

1. *One curve*, which should be either a part of a circle or an ellipse. Draw it first on the black-board, above a line, below a line, to the right of a line, to the left of a line. 2. *Two curves*, draw the concave sides parallel or opposing; the convex sides similarly, one above and one below a line; form concave angles and convex angles. 3. *A circle*, use diameters or draw in a square. 4. *An ellipse*; let the study of this be very thorough.

(c) *Application*.—Invite memory drawing, show designs, and discover the adaptation of natural forms to ornament.

(3) **Third Stage of Freehand Drawing**.—The work to be accomplished now must be of a more advanced character, but its value will depend upon the thoroughness and skill displayed in the execution rather than in the difficulty of the drawing. In this stage more opportunities will be presented for refining the taste with respect to grace and beauty.

(a) *Eye-training*.—The nature of the curves and the relative proportion of the spaces should be pointed out, and the whole copy thoroughly and completely studied. Distinguish the

main outline of the form from the minor details; let these be secondary. Suggest or obtain suggestions as to "blocking-out". Trace its counterpart in nature or in some object. Mark the occurrence of tangential curvature. Discover the distinguishing graces of the copy.

(b) *Hand-training*.—Any specially difficult or intricate parts of the copy should be separately practised as occasion requires. The general steps will be: 1. Block out the whole drawing, whether a balanced or an irregular one. 2. Sketch lightly the outside lines, proceeding from left to right; that is to say, first draw on the left, then draw the corresponding piece on the right; also work from the top towards the bottom. 3. Draw the inside lines, working from top to bottom or from the centre outwards. 4. Entirely rub out the "blocking lines", and leave the sketching lines very faint. "Line in" with a distinct, firm, gray line. 5. Repeat the copy, either on the same day or on another, until it is done satisfactorily. The "blocking-out" is a good and valuable exercise. There should be no hurry; and slovenly, inaccurate work should not be allowed. Avoid showy and hasty work, and pass nothing that is roughly produced or out of proportion.

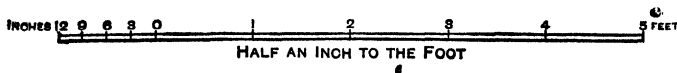
(c) *Application*.—Enlarge parts of the copy. Reduce parts for use in designs. Repeat freely the whole or parts to form a pattern.

B. Drawing with Mechanical Aids.

(a) *The First Stage of mechanical drawing* will consist of similar right-lined figures as in the early freehand stage, to be examined, executed, and applied. The important difference is that the hand-training will be done with the assistance of a rule or straight edge. The lines must be drawn clear and sharp with the utmost accuracy and exactness. Let the first line be strictly horizontal, and become the standard from which to work; all other lines to be adjusted by means of this. Set squares and compasses are not necessary at this stage. Measurements can be made with the twelve-inch rule, and when a line is required perpendicular to another, it can be obtained by adjusting the rule with the inch-line, covering the line to which it is to be perpendicular.

(b) *The Second Stage of mechanical drawing* consists of making simple geometrical figures with the aid of rules, and the construction of simple scales and their application. Subdivisions of the work are essential: 1. Simple geometrical

figures, as the pentagon or hexagon, should be drawn singly and in combinations; for lines in the same direction one application of the rule should suffice. 2. Forms to be drawn on squared paper should first be shown on the chequered board. The sketch with the dimensions marked should be as near as possible in size to the real object. 3. Scales require careful numbering: divisions of the scale should be numbered from



right to left, the measure from left to right. 4. Enlarging plane figures to twice or three times the size, or reducing them strictly in proportion. 5. Drawing objects on plain paper according to scale to the dimensions given.

(c) *The Third Stage of mechanical drawing* in a progressive course consists of: 1. Drawing geometrical figures with instruments and to scale. Exactness is essential; heavy working lines cannot be allowed. 2. More advanced geometrical construction of figures. 3. The plans and elevations of plane figures and rectangular solids in simple positions with or without sections.

C. Drawing from Models.

(1) **First Stage.**—Models from regular forms, as the cube, square prism, &c., and easy common objects.

(a) *Eye-training.*—As there are almost as many views of the object as there are children in the class, only general principles can be taught collectively. Begin with a large surface like a door. Place in front of it a glass plane; draw on the glass. When the sketch is finished the children should file out to see that the lines drawn actually cover the outline of the door. Then show that verticals are always to be drawn vertically, parallels vanish towards the same point; horizontal lines above the eye descend, those below ascend.

(b) *Hand-training.*—The teacher directs attention to a line; the children draw it from their own point of view. Examine each exercise to see the above principles are followed. Master a vertical surface before attempting a horizontal one.

(c) *Application.*—When the principles are made secure, examine the geometrical models and draw them. Trace any analogy in common objects, as, for example, the cornucopia a

modification of the cone. Many forms in nature may be reduced conventionally to the type of the cylinder or sphere.

(2) **Second Stage.**—Common objects and casts of ornament in light and shade. If the previous stage is mastered there will be very little difficulty in drawing groups. Encourage the children to sketch objects out-of-doors and bring them for inspection. Teach how changing the position and details of an object changes its character and makes it practically a new object. 1. By changing its place with regard to the position of the eye: below, above, at the left, at the right, below and at the left, below and at the right, above and at the right, above and at the left, directly in front; hence there would be nine drawings of one object. 2. By changing the materials of which the object is composed: a hut may be of planks, or logs, or bricks. 3. By arranging the details differently: doors and windows may be put in different positions actually and relatively. Shading should be done with the blacklead pencil or with French chalk and stumps. The following rules, if followed faithfully, will probably be found of service:—

1. Place the model so that the light falls upon it from one direction only.
2. Sketch the model and its shadows with blacklead pencil if for pencil shading, with charcoal pencil if for chalk shading.
3. Discover the varying shades, distinguish their depths, marking them by numbers, and lay on even shades, proceeding successively from the darkest to the lightest. As a rule it is best first to shade lightly the shadows and background.
4. Graduate the shades, and darken the shadows where required.

The suggestions that have been offered on drawing are, owing to the exigences of space, very inadequate, seeing that this is the eye and hand training, which may be said to be universally taught. For full treatment a special book must be consulted.

D. Modelling in Plastic Substances or Cardboard.—The “mud pies” of childhood remind one of the instinct for “making up”. Many materials are adapted for modelling, but they are not all equally serviceable in the schoolroom. Among the list will be found sand, clay, putty, paper-pulp,

and plaster of Paris. The sand model must necessarily be very temporary in character; still it is of great use in geography, and the forms are retained quite long enough when a due proportion of salt is in the mixture. Clay is better than putty, while both lend themselves to fair permanence. Paper-pulp is inexpensive, and very suitable for home-made models of a permanent character. Plaster of Paris can only be used by advanced pupils under special circumstances.

Besides the use of plastic materials, it has been found that modelling in cardboard is an effective means of training; in fact, clay or cardboard is the material generally employed in the schoolroom. Like all other work, it demands a progressive course.

(1) Clay Modelling.

(a) *First Stage*.—The materials needed are clay, real objects, a board or a slate. The object to be modelled should be shown, examined, and discussed, or a story be woven around it. Then the teacher, in view of the pupils, should model the form; afterwards directing the children's exercise by telling how much clay to take up, how to handle it, and how to proceed step by step. Cleanly and exact habits of work must be insisted on in this early stage. Suitable objects are a ball, an orange, a plum, an egg, a brick, &c.

(b) *Second Stage*.—More difficult models can be attempted, such as a sphere, an apple, a cylinder, a banana, a cone, a horn, eggs in a nest, potatoes in a bowl. The aim will be to establish some connection in the mind between geometrical models and common objects, either of nature or art, and to attempt grouping.

(c) *Third Stage*.—Practice in modelling simple objects must be continued with leaves, shells, vases, &c.; but modelling in relief will now add a freshness and a beauty to this occupation. For this purpose tools may be usefully employed, although they need not be anything more than a paper-knife and a stick of slate-pencil. On a thin layer or slab of clay will be drawn the outline of the intended model, such as a bird's wing, spray of leaves and fruit, an animal form; then the highest and lowest points of relief must be noted, and clay added accordingly until the object is complete.

(2) Cardboard Modelling.

Modelling in cardboard cannot be begun very early; it might, however, follow the second stage instead of the relief

modelling. The cardboard first used should be of medium thickness, care being taken not to cut right through, nor to cut with one stroke, but rather by a repetition of strokes, with a sharp knife pressed firmly against a straight edge, while the cardboard rests on a smooth hard substance like a sheet of glass. All sorts of geometrical forms can be made, as boxes, trays, toilet tidies, brackets, &c.

E. Paper Folding, Cutting, and Mounting.—The *First Stage* consists of the imitation of patterns. Unless the pattern is large the teacher will do well to draw the design on the black-board with coloured chalk, so that the pupils can see what is required of them. Another board should be at hand to enable the teacher to build up step by step, either in material or coloured chalks, the work to be copied under his direction. This style of class demonstration must be made very effective, or progress will be slow. The materials supplied to the children will be squares of coloured paper, a pair of scissors or a knife, chequered cards or sheets of paper, and a damp sponge. The tinted papers will be folded, cut, and fastened like postage stamps, so as to lie in given positions and cover a given number of squares. The accuracy of the cutting, the exactness of the adjustment of the pieces, and the juxtaposition of the colours, constitute the completeness of the exercise. The designs need grading from the simplest to the elaborate.

In the *Second Stage* more originality is to be cultivated, and provision is made for adapting patterns, tracing them to their simple origin, distinguishing the “repetition” and the “alternate” pattern, thereby developing the faculty for invention in designing.

F. Drawing and Colouring.—A correctly coloured design is needed for inspection. The teacher and children will work out the form of the design, and the colouring of the same, in progressive steps. Mechanical aids may be used in the drawing. The paper should be rough, and at first only the crayons actually needed should be supplied. Let the class work at the teacher’s dictation, but he must be very active in getting in and about the class. In a more advanced stage the colouring can be done with “washes”. The colours need to be thoroughly mixed every time the brush is filled, and applied in a smooth, even wash from left to right, and in a downward direction, taking care not to apply colour over or near any wash that is not thoroughly dry. Blotting-paper may be judiciously em-

ployed to increase the amount of work to be done in a lesson, or otherwise progress will sometimes be tediously slow.

G. Wood-work for Boys.—Bench work for boys is hardly practicable until about the age of eleven or twelve, and up to that period preparation of a progressive character should be pursued. In order that full benefit may be derived from the actual exercises in the workshop, the following stages are suggested as a varied occupation.

First Stage.—(a) Building with wooden cubes or bricks, and drawing outlines of the plans on squared paper. (b) Names, uses, and materials of such tools as hammer, mallet, gimlet, screw-driver, and saw. (c) Names and properties of common woods.

Second Stage.—(a) Building, drawing plans and end elevations on squared or plain paper. (b) Names, uses, and materials of such tools as the plane, square, marking-gauge, tenon-saw, pincers. (c) Recognition of woods, as yellow deal, bass, cedar, walnut, and their suitable uses.

Third Stage.—(a) Building, drawing plans and elevations of the same; introduction to isometric drawing. (b) Names, uses, and materials of such tools as dividers, try, jack, and smoothing planes, and saws. (c) Classes of timber trees; glue.

Fourth Stage.—(a) Building, and drawing to scale; isometric drawing. (b) Names, uses, and materials of such tools as brace and bit, oil-stone, grindstone. (c) Growth and structure of timber trees; knots; seasoning; joints.

Fifth Stage.—(a) Exercises in drawing and marking on wood angles and regular geometrical forms; also plans and elevations and isometric drawings. (b) Exercises in using the various tools as are strictly necessary. (c) The making of simple models, introducing step by step the use of the required tools in progressive order. (d) Joints, such as half-lap, mortise and tenon, and dove-tail.

H. Metal Work.—In some localities metal work will probably supersede the working in wood, which has been found clean, cheap, and in every respect well adapted to the training of the eye, the hand, and the mind; for soft lead, pliant copper, and stiff iron may be as cheap and yet more attractive. So long as interest is awakened, material is a secondary consideration. Skilled labour is a pressing need, and it is only to be met by training the eye to the habit of seeing clearly, and the hand to execute with firmness and accuracy.

SUMMARY.

1. Skilled work demands early training of the eye and the hand. Such training is necessary to ensure capability, self-confidence, and self-helpfulness.

2. The advantages are physical, mental, and moral; for the eye and the hand are increased in power and the body is strengthened, intelligence is promoted, and industry fostered.

3. Among the many devices for manual training are—Drawing, cutting out and inventing paper patterns, modelling in clay or cardboard, weighing and measuring, the use of simple tools, wood-work, and metal work.

4. In freehand drawing no ruling, measuring, squaring, tracing, or use of instruments is allowed. Each lesson should consist of eye-training, hand-training, and an application of the teaching.

5. Objects and actual measurements assist in making mechanical drawing interesting as well as instructive.

6. Models require careful examination before the drawing is commenced. Large drawings are best. A glass plane is useful for first lessons.

7. Clay for younger children and cardboard for the elder ones are suitable materials.

8. Paper work is a continuation of the kindergarten lessons of the infant school.

9. Wood-work and metal work require preparatory exercises in the early school stages.

GOVERNMENT QUESTIONS.

1. Describe the kind of manual employments best suited to give ideas of form and of construction, and to give training in invention and design.

2. Describe in words and with your own diagrams a suitable elementary course of freehand drawing, either (a) for an infant school, (b) for a school for older children.

3. Write a short essay on the relative values of manual and intellectual training, and show how both ought to be kept in view in the management of a school.

4. Give some examples of a child's first steps in learning to draw, and explain the progressive nature of each step.

5. Describe the earliest lessons in drawing which should be given.

CHAPTER XXI.—PHYSICAL EXERCISES.

1. **Their Importance.**—The *Instructions to H.M.I.* states "The discipline and organization of a school is considered unsatisfactory where no provision is made for instruction in Swedish or other drill, or suitable physical exercises".

Dr. Carpenter in his *School Hygiene* says: "Physical exercise is indispensable; and it is quite impossible for the functions of

respiration and circulation to be carried on in a proper manner if the muscular system is not developed, and if the material which is necessary for the formation of muscle is not used up in its proper order. If the muscles are not used equally with the brain tissue, some used-up matter is kept back, and will sooner or later act as an impediment to proper brain-work."

2. Advantages of Physical Training.—Amongst these are—

(a) *A healthy frame is developed.*—The muscles by exercise become strong and healthy, and are thus fortified against disease. Use increases not only power, as in this instance, but also grace; for an upright carriage and graceful movement can be obtained under judicious systems of training.

(b) *General health is improved.*—By exercise respiration is increased, and there ensues an increase of warmth, a removal of waste tissues, and a more ready assimilation of food; hence it is well for drill to precede meal-time.

(c) *The brain is rested.*—Under proper guidance the various movements are performed almost automatically, so that a minimum of mental effort is required. Moreover, the interest and pleasure evoked by imitation and muscular activity conduce to a restful condition of the mind. Pleasurable doing refreshes as well as rests the brain.

(d) *Discipline is improved.*—A well-drilled school distinguishes itself by the ease with which lessons are changed by signal, and the children, singly or in class, move from place to place. The smart word of command followed by immediate performance, enforces the habit of prompt and cheerful obedience.

3. Conditions of a Good Scheme.

(a) The body must be put under the influence of all the agents which promote health and strength. This necessitates the teacher's acquaintance with physiology.

(b) All the muscles must be developed equally. One set of muscles must not be developed and others omitted, or distortion will result.

(c) The muscles should be brought into play in rotation from head to foot. There will then be no round shoulders, twisted spine, stooping and shuffling gait.

(d) The course should be simple, definite, and progressive, and the movements graceful and free from any appearance of the ridiculous.

(e) The exercises should be done briskly, demand exertion to overcome resistance, and stimulate the respiratory organs. Of course there should be no injurious movements or undue strain.

(f) Variety is essential to render the exercises interesting and entertaining, thus associating pleasure with work.

(g) Apparatus should not be necessary, and the exercises should be of such a character that they can be performed either in the school or in the playground without changing the ordinary dress.

4. The Means of Physical Training.—"Whenever circumstances permit, the best form of physical exercise is a healthy game, and in country schools such games are almost always possible. In most town schools, however, even in those which possess large playgrounds, such games are impossible, or possible only for a few scholars. The physical development of the frames of growing boys and girls imperatively requires, therefore, in such cases, some scientific form of drill and gymnastics, and it becomes incumbent on teachers to make themselves familiar with those exercises that are best suited to develop a healthy frame without undue strain upon the scholar." (*Instructions to H.M.I.*)

(a) *Healthy games.*—Such are: leaping, running, swimming, cricket, fencing, football, rounders, rackets, tennis, fives, leap-frog, hop-scotch, blindman's-buff, hoop-rolling, battledore and shuttlecock, skipping, and many others more or less locally or universally known. In some of the games the teacher will do well to join; in others to look on, showing by his presence sympathy and interest.

It should be borne in mind that free play is far superior to any artificial scheme, yet much benefit may be derived from systematizing some games, as, for example, "the skipping-rope drill". In this all the muscles are exercised equally. When the various evolutions are performed to the strains of the piano, the effect is most pleasing, and in addition to the muscular training there is the training of the ear by rhythmic movement in time and tune.

All games should be played as far as possible in the open air. A school which is unprovided with a hall is somewhat handicapped during the winter months; but a "class-run" in the playground, when steadily conducted, provides very pleasurable and beneficial exercise.

(b) *Scientific systems*.—Many and various are the systems competing for popularity. There are The Swedish, The English Military Physical Training, Military Drill, and others more or less fantastic in their use of dumb-bells, clubs, flags, poles, &c. The latter ornamental drills aim mostly at elegance and grace of movement, and are generally designated Calisthenics.

It is advantageous for the teacher himself to undergo a course of training; for, although books may be consulted and the distinguishing features of a system discovered, it is impossible to do without practice.

The following analysis will show the general order of movements:—

- (1) *The Head movements*.—The head is moved at the word of command either forward, backward, or sideways.
- (2) *The Arm movements*.—The arms may be raised sideways, forward, or backward; *swung* forward, overhead, or backward; *stretched* upward, downward, or outward.
- (3) *The Trunk movements*.—The trunk may be bent forward or backward; *turned* to the right or to the left.
- (4) *The Leg and Foot movements*.—The knees may be bent and stretched, the heels raised and lowered, and feet closed and opened.
- (5) *The Hip movements*.
- (6) *The Shoulder movements*.
- (7) *Combination movements*, combining any of the foregoing, as trunk and arm, or leg, arm, and body.

5. Rules for Guidance in Teaching.

- (1) Drill in the open air when the weather and other circumstances permit.
- (2) Give each pupil ample room.
- (3) Stand where you can see the whole class and be seen by the children.
- (4) Pattern a movement as perfectly as possible before the class.
- (5) Explain the function or special purpose of the movement.
- (6) Let the class imitate the whole or part of the movement at the word of command.
- (7) Give the word of command distinctly and with precision; but avoid shouting. A word of command consists of two parts: the first part should be given slowly, as a caution to the children to be on the alert; the second part is sometimes given

slowly, but more often quickly and smartly. Always pause between the cautionary word and the executive word. Thus: Eyes (*slowly*)—front (*quickly*).

(8) Watch carefully the performance of every movement. Insist on a correct attitude. Occasionally allow a smart child to pattern.

(9) Make the work as pleasant as possible.*

• (10) Study each child's constitution and powers of endurance, and give rests between the movements.

(11) Avoid over-fatigue, for excessive exercise is injurious. It is well to give the lesson when the children will soon be getting a meal.

(12) Excuse the physically unfit. The *Instructions to H.M.I.* says:—"As regards half-timers, it is very undesirable that they should be subjected to any system of exercise or drill which, if practised in the morning, might render them unfit for their afternoon's labour, or, if practised in the afternoon, might press heavily upon a tired boy or girl. Children who have walked long distances to school should also be excused."

6. Class Drills.—Before leaving this subject of physical exercise, a relatively minor and much neglected branch needs some mention, because of its immense value in the discipline and well-being of the class. We refer to the *class drills* for the distribution and collection of materials, such as pens, pencils, slates, books, ink-wells; for entering and leaving the desks; for standing, sitting, or in any way altering the formation of the class; for assembling, saluting, and dismissing; and for movement from place to place. The different circumstances of schools preclude anything but a general mention. Take, however, the following drill for collection of books as a sample of what is intended.

Cautionary word, "Collection of books". "*One*", hold the book in the right hand; "*Two*", pass the books to the right; "*Three*", right-hand child to turn about and walk quietly to the back row; "*Four*", the child brings collected books.

Again, consider a class about to enter a room. "Heels raise", "Enter", "Front turn", "Halt".

SUMMARY.

1. A system of physical exercises is essential to the discipline and organization of every school. Physical exercises are indispensable to health.

2. Under a proper system, the muscles become strong and healthy; the

back straight and the frame upright; the respiratory organs increase in power; the brain is rested, refreshed, and invigorated; and prompt and cheerful obedience becomes a habit.

3. All parts of the body demand exercise to secure health and graceful movement. The course of instruction should be simple, progressive, and pleasurable.

4. Healthy games, scientific systems, and class drills all afford opportunities for physical training.

5. Any system must duly exercise the movements of the head, trunk, and limbs without requiring the use of apparatus.

6. When teaching, pattern and explain the movements, ensure precise imitation, avoid strain of voice in giving commands, and aim at willing and prompt obedience.

7. Secure orderly distribution and collection of school materials, as well as prompt changing of lessons, by systems of drill using numbers as the word of command.

GOVERNMENT QUESTIONS.

1. Describe the most healthful and useful exercises in drill which you have seen, and say how you would conduct them.

2. For what purposes is school drill useful?

3. What movements of drill were required in your school on entering or leaving the room, and for changing class? What are the objects of school drill? Show that it has an influence on the character of children and their behaviour out of school.

4. What do you consider the uses of a playground, and how would you endeavour to make it subservient to the discipline of a school?

5. Describe the best system of drill and physical exercise you know for young children (a) in the schoolroom, or (b) in the playground.

6. Explain the physical and moral advantages of drill for children.

APPENDIX A.

MODEL ANSWERS TO AN EXAMINATION PAPER.

QUEEN'S SCHOLARSHIP EXAMINATION.

SCHOOL MANAGEMENT.

[All Candidates *must* answer Question 1, and not more than *six* other questions. If you answer more than *seven* questions in all, only the *seven* answers coming first on your paper will be revised.]

1. Write full notes of a lesson on one of the following subjects:—

- (a) A Bird's Nest. (For infants.)
- (b) The Steam Hammer.
- (c) The Suez Canal.
- (d) The Armada.

2. Give a few good rules to be observed in school for the protection of the eyesight of the children.

3. What do you consider are the advantages of children learning recitation? How may these be secured?

4. It is often found that the answering in class subjects is confined to a few of the children. What are the causes of this, and how would you remedy it?

5. What should be the minimum length of slate pencils? What are the disadvantages of the use of very short ones? Give a description of any pencil drill you know.

6. Make out a syllabus of work to be done by the end of the first quarter of the school-year for

- (a) First class infants; or
- (b) The fourth standard.

7. In teaching grammar what should be the object of the teacher as regards mental discipline? How may this be attained? Take a lesson to Standard II. on the verb to illustrate your answer.

8. Frame some questions in mental arithmetic for Standard II., having in view the preparation for the arithmetic of Standard III.

9. Make out a list of six suitable occupations and games for babies, and describe the manner in which you would conduct them.

10. What are the uses of a course of object lessons to Standard III.? Make a list of ten suitable lessons.

11. Show how school discipline may be useful in forming habits of punctuality and prompt obedience to orders.

12. At what stage in a lesson would you give a definition? Show how you would lead up to and work out the definition of an adjective to Standard III.

13. Describe the faults most common in the reading of children in the upper standards. How would you correct them?

14. What explanations would you give to Standard VI. if reading the following:—

“It was not by vile loitering in ease
That Greece obtained the brighter palm of art,
That soft yet ardent Athens learned to please,
To keen the wit, and to sublime the art,
In all supreme! complete in every part!
It was not thence majestic Rome arose,
And o’er the nations shook her conquering dart;
For sluggard’s brow the laurel never grows;
Renown is not the child of indolent repose.”

Note.—The answers are given with just sufficient fulness to enable them to be written *within the prescribed time*. They therefore show the student the degree of fulness which an examiner may reasonably expect.

NOTES OF A LESSON

ON

THE SUEZ CANAL.

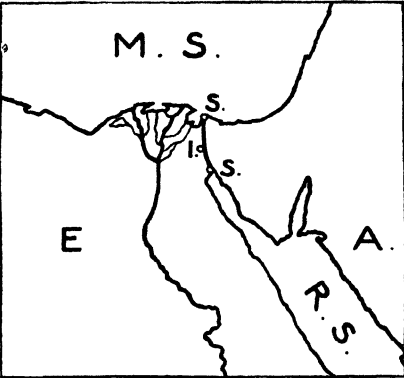
Class.—Upper Division.

Time.—30 minutes.

Aim.—To show the Imperial and Commercial importance of this highway to the East.

Illustrations.—Map of the World (Mercator’s projection); a prepared model; *P. & O. Guide Book for Passengers*; picture of M. de Lesseps.

MATTER.	METHOD
<p>I. Necessity for a quick route to the East.</p> <p>The British Dominions in the East consist of Hindostan and Australia. Many of our countrymen live there, and like to send and receive frequent letters from home. The productions of our islands, as well as of France, Germany, and Holland, &c., are sent to India, Australia, China, and Japan in exchange for their productions. Time and distance are important considerations in trade.</p>	<p>I.</p> <p>Point out on the map, and note the relative positions of, the British Islands and Hindostan, &c. Trace a line on the map to Bombay round the C. of Good Hope, and another through the Mediterranean and Red Seas. Compare the distance. Tell of the conveyance of passengers and mails by land across the Isthmus and of freight round the Cape. Note coal could be conveyed to Suez across the Isthmus cheaper than by the Cape.</p>

MATTER.	METHOD.
<p>II. Description of the Canal.</p> <p>The distance from Port Said to Suez is about 99 miles. The soil is mainly shifting sand of the desert, and mud brought down by the Nile. The depth of the Canal is some 23 ft. in the middle; at intervals of about 6 miles two vessels can pass one another owing to a greater width. At each end is a harbour—Said on the Mediterranean Sea, and Suez on the Red Sea; midway is Ismailia. Ships pass through in about a day.</p>	<p>II.</p> <p>Show a model in sand of the Canal. Describe the engineering difficulties to be overcome with such shifting material. Mark the towns and relate their growth in population. Let the class make a sketch map on their slates.</p> 
<p>III. Its Value.</p> <p>Immense advantages foreseen by M. de Lesseps, the engineer, have been realized. The mails reach India (Bombay) in two weeks instead of three. Travellers reach their destination in much shorter time than formerly and at much less cost. Freights are cheapened, and goods of a perishable nature made available by rapidity of transit. Protection can be more quickly given to our Empire.</p>	<p>Mark the surroundings; point and name the places. Explain the "draught" of a ship.</p> <p>III.</p> <p>Show a picture of M. de Lesseps. Tell the prejudice that had to be overcome as well as the physical barriers. Examine the <i>P. & O. Guide Book</i>, and find the time and cost to Port Said, Bombay, Singapore, Victoria. Inquire the nature of the cargoes. Tell some. Discover the advantages of quick passages. Refer to the importance attached to the neutrality of the Suez Canal.</p>

BLACK-BOARD SUMMARY.

England and the West of Europe, trade with Hindostan, China, Australia, New Zealand, and Japan.

The old route for cargoes was round the Cape of Good Hope, while letters and passengers went over the isthmus on land by caravans or by rail.

The Canal is 99 miles long. It is a day's voyage. The towns are Said, Ismailia, Suez.

M. de Lesseps was the engineer.

The value of the Canal has been proved. Mails and passengers are conveyed quicker and cheaper. Trade has increased because the journeys are more frequent and less expensive. Fuel and food are saved.

ANSWER No. 2.

The first and foremost consideration with regard to a child's eyesight is to *avoid straining the eyes*. To further our object we must secure good light, provide suitable material, and attend to the posture of the child.

A. The Light.

- (1) Arrange the desks so that the light falls from the left and above. When the light falls from the right or from behind there is shadow, and the eyes must be strained to see; when from the front there is glare upon the eyes.
- (2) Let artificial light be sufficient and well diffused. Dimness of lighting throws overwork on the eyes, which is evident to the onlooker by reason of the bent head and painful expression on the face.

B. The Materials.

- (1) Provide reading-books with a good type.
- (2) Let all illustrations be as large as possible.
- (3) Use a black-board with a dull surface.
- (4) Let all writing on the black-board be large and clear.

C. Posture of the Child.

- (1) Insist upon an upright position in writing. It is essential that the child should look at the writing directly, not obliquely. The eyes should not be carried to the writing, but the writing should be of such a size that it can be seen with ease at the proper distance.
- (2) The reading-book must be held eleven or twelve inches from the eyes.

ANSWER No. 3.

The following are some of the *advantages* to be derived from careful learning of *Recitation*:—

(1) New thoughts are provided.

Study of the incidents, characters, references, allusions, and figures of speech enlarges the child's ideas and provides much scope for reflection. Hence full explanations and illustrations of the passages are essential for securing this end.

(2) The imagination is cultivated.

True poetry clothes the ordinary affairs of the world in beautiful language, sometimes visionary in its nature, yet capable of appealing to the mind through the vividness of the powers of imagination. Therefore the teacher

himself should enter enthusiastically into the spirit of the piece and infuse the same enthusiasm into the class. Assisted by good descriptive language he will enlist the sympathy of his pupils.

(3) The taste for literature is improved.

The elevating thoughts aroused by a passage of good poetry affect the nature of the child. A refining influence is felt which eventually shows itself in the manners of the child, and in its choice of matter for reading. To secure this end the teacher must be a lover of poetry, and capable of discovering and explaining the real beauty of the poet's thoughts and expressions.

(4) Expression in reading and in speech is improved.

Recitation should reach the highest standard of perfection in regard to distinctness of utterance and expression. The teacher can secure this end by first learning the poetry himself, then he will be able to set a good pattern and listen to hear it faithfully copied, without his attention being distracted by the necessity of looking at the words. The teacher must be a model reciter.

(5) The child's knowledge of language is increased.

New words intelligently learnt and explained increase the child's vocabulary. Whenever words and phrases are explained they should also be used in sentences constructed by the children.

• ANSWER NO. 4.

When the answering in class subjects is confined to a few children, it is as a rule the fault of the teacher more than that of the pupils.

<u>Causes.</u>	<u>Remedies</u>
1. Lack of interest in the lesson.	1. Thoroughly prepare and fully illustrate the subject.
2. General listlessness.	2. Secure the co-operation of the scholars; they like to be doing.
3. Failure to comprehend.	3. See that the lessons are adapted to the capabilities of the average scholar.
4. Attention given to bright pupils only.	4. Distribute your attention over the whole range of the class, allow no "fringe", and stand so as to see the whole class.
5. Neglect of the dull scholar.	5. Frame the questions simply, so as to encourage the dull child to persevere.
6. Want of a stimulating rivalry.	6. Arrange for those who answer to retain seats, while others stand. Contrast the work of different sections.

• ANSWER NO. 5.

A slate pencil should not be used when it is shorter than the middle finger of the right hand. Of course short pieces can be put into holders.

Short pieces cannot be held properly between the thumb and the first and second fingers; and hence, not being capable of being held freely, their use produces cramped writing.

Use of short pieces is productive of *bad habits*; and as pencils are most frequently used in the lower classes, whenever the pen is to be used great trouble has to be taken to insist upon its being held properly.

A short piece of pencil must be held near to the tip, and if the same thing is done with a pen the fingers get inky.

The following has been found to be a useful *Pencil Drill*:—On the command “*One*”, hold pencil vertically in the left hand; “*Two*”, hold out right hand somewhat as if about to shake hands; “*Three*”, place the pencil between the thumb and first and second fingers about an inch from the point; “*Four*”, place the left arm on the desk, bring the point of the pencil on to the slate at the same time rolling the hand over; “*Five*”, begin writing.

ANSWER No. 8.

The Standard II. should be prepared mentally to do Long Division, and Compound Addition and Subtraction of Money, by way of preparation for Standard III.

- | | |
|---|----------------------|
| 1. Divide 1000 marbles among 50 boys. | 20 marbles each. |
| 2. How many times can 202 be subtracted from 606? | 3 times. |
| 3. How many years are there in 312 weeks? | 6 years. |
| 4. The divisor is 17, quotient 7: find the dividend. | 119 is the dividend. |
| 5. How many dozens in 1212? | 101 dozens. |
| 6. Find the sum of 2s. 2d., 3s. 3d., and 4s. 4d. | 9s. 9d. is the sum. |
| 7. One book cost 1s. 10½d., another 2s. 1½d.: find total cost. | 4s. total cost. |
| 8. What will be left when 10s. 1d. is spent out of £1? | 9s. 11d. left. |
| 9. What is the difference between four guineas and £4? | 4s. difference. |
| 10. A horse and cart cost £30, the horse cost £4 more than the cart: find the cost of each. | £13. £17. |

ANSWER No. 11.

School discipline is that attitude of body and mind maintained by a child when in school, which tends to foster self-control and self-advancement:

(a) Punctuality is obtained by—

- (1) The teacher's discipline of himself, as shown in his own early attendance.
- (2) Proper arrangements for the assembly, inspection, and dismissal of the classes.
- (3) Regular changing of lessons.
- (4) Regular succession of lessons.

(b) Prompt Obedience is inculcated by—

- (1) Cheerful submission to authority in one's self.
- (2) Prompt and distinct orders whenever necessary.
- (3) Systems of drill for distribution and collection of material, for entering and leaving the desks, for entering and leaving the school.
- (4) A system of class orderlies who should be obeyed implicitly, provided they do not give commands that the teacher would not give.
- (5) Seeing that an order once given is punctually obeyed.
- (6) Vigilance at all times.

APPENDIX B.

• GOVERNMENT REQUIREMENTS.

(a) PUPIL TEACHERS.

SECOND YEAR.

- To conduct a class in one of the elementary subjects, and to answer simple questions on the mode of teaching those subjects.

THIRD YEAR.

To conduct a class in arithmetic or in any class subject taught in the school; in an infant school on form, colour, number, or some familiar object; to prepare notes of a lesson, and to answer questions as above.

(b) QUEEN'S SCHOLARSHIP EXAMINATION.

PRACTICAL TEACHING. [125 marks.]

To give a collective or class lesson on any subject taught in Elementary Schools. (An object lesson may be required.)

Marks for giving a lesson can only be obtained by candidates employed as teachers in any capacity in Public Elementary Schools. The lesson must be given at the Inspector's visit to the school next preceding the Queen's Scholarship Examination.

To prepare notes for any such lesson.

To answer questions as to the mode of giving any such lesson.

In Welsh districts additional credit will be given (in the class teaching lesson) for ability shown in utilizing the children's knowledge of Welsh for the acquisition of English, or the fuller understanding of the English lesson.

Girls may be required to give a lesson in needlework suitable for any prescribed standard.

SCHOOL MANAGEMENT. [125 marks.]

Notes of lessons.

The methods of teaching the elementary and class subjects.

The methods and principles of infant teaching and discipline, and of cultivating the intelligence of children.

(c) FIRST YEAR CERTIFICATE EXAMINATION.

SCHOOL MANAGEMENT. [100 marks.]

1. The general principles of teaching.
2. The methods of teaching the elementary and class subjects and drawing. The methods and principles of infant teaching and discipline and of cultivating the intelligence of children.

3. Notes of lessons.

4. The training of the senses and memory, and the order in which the faculties of children are developed.

Passages taken from Reading Lesson Books commonly used in schools may be given in the papers on all subjects which admit of it, and candidates will be expected to show how they would explain such passages to children. Each paper may also contain questions on the method of teaching the elementary parts of the subject to which it relates.

APPENDIX C.

INSTRUCTION OF INFANTS.

Circular 332

Education Department.

WHITEHALL, 6th February 1893.

SIR,—You will have observed that in the Education Code of 1892, teachers holding either the Elementary or Advanced Certificate of the National Froebel Union are allowed to rank as assistant teachers in infant schools under inspection. And you will doubtless have rightly inferred from this concession that the Department are desirous of giving further encouragement to the employment of Kindergarten methods.

The circumstances of infant schools have altered considerably in the last few years; the numbers in the lower classes having increased (especially in schools which have accepted the Fee Grant, and have consequently either abolished or largely reduced their school fees), a full four years' attendance at the infant school will be the rule and not the exception. The improvement also shown in passing the standards at an earlier age than formerly gives to infant schools greater liberty and leisure in developing natural methods of education.

As regards the Elementary Subjects the conditions of the Code are fully satisfied if the scholars over seven can pass, as a rule, in the First Standard; nothing more should be attempted in these subjects in the infant schools, except in the few cases in which scholars are allowed to be retained for the work of the Second Standard. The scholars in the lower classes of infant schools may therefore be relieved from any premature preparation for those subjects on methods ill-suited to their tender age.

Two leading principles should be regarded as a sound basis for the education of early childhood:

- (1) The recognition of the child's spontaneous activity, and the stimulation of this activity in certain well-defined directions by the teachers.

- (2) The harmonious and complete development of the whole of a child's faculties. The teacher should pay especial regard to the love of movement, which can alone secure healthy physical conditions; to the observant use of the organs of sense, especially those of sight and touch; and to that eager desire of questioning which intelligent children exhibit. All these should be encouraged under due limitations, and should be developed simultaneously, so that each stage of development may be complete in itself.

It has been strongly urged that sufficient attention has not been paid in the past to these principles; indeed, it is often found that the Kindergarten occupations are treated as mere toys, or amusing pastimes, because they are attractive for children, and the intellectual character of the "Gifts of Froebel" is disregarded, whereas the main object of these lessons is to stimulate intelligent individual effort.

You should direct the attention of teachers to the chief consideration which underlies true methods of infant teaching, viz. the association of one lesson with another through some one leading idea or ideas. The reading lessons, occupations, and object lessons may all be usefully combined for one purpose, *e.g.* if the teacher wishes to impress on her class some knowledge of a domestic animal, she may usefully combine the object lesson for general study of its structure; the reading lesson for a knowledge of its habits and character; some occupation, such as pricking the outline, to impress an exact knowledge of its form; a song or simple story bearing on its association with human life; so that familiarity with animals, especially with domestic animals, and a kind treatment of them may be fostered.

On the other hand you should caution teachers against the mere repetition of the same exercises and lessons; the progressive character of the whole scheme of instruction should be constantly kept in view; and each exercise should lead up to something beyond itself.

Pictures and flowers have been wisely introduced of late in greater abundance into infant schools, and have added much to their cheerfulness and attractiveness. They should be frequently taken down into the class, and made the subject of conversation. It is not enough that the children should be taught to observe these things and to answer questions upon them. They should be encouraged in every way to give expression in their own words to what they know, what they want to know, and what they think.

It will be found that the Elementary Subjects when taught on right methods can be treated with greater variety; Reading becomes a Kindergarten lesson through pictures and word-building; Writing becomes a variety of Kindergarten drawing; elementary exercises in Number are associated with many of the Kindergarten occupations.

It is the experience of many good teachers, that by the adoption

of such methods it is found to be unnecessary before the sixth year is passed to employ books for Reading, except occasionally for a change of occupation, or perform any exercise in Writing except the elements of letters, or to do any formal Arithmetic work on slates.

It may reasonably be hoped that the observance of these suggestions will materially improve the work of the younger children in infant schools and classes, by relieving the teacher from that useless subdivision in the elementary subjects which has been hitherto generally employed, and by rendering the instruction less formal, but more varied and attractive.

A list of Varied Occupations is appended to this Circular.—I have, &c., G. W. KEKEWICH.

The following list of varied occupations may serve as a guide to teachers, especially in infant schools or classes which may be divided into two sections for those lessons.

A.—What children between the ages of five and seven can do:—

Games with music.
 Games without music (guessing names, &c.; taking messages).
 Picture lessons.
 Object lessons.
 Story lessons, *e.g.* stories from history; *Grimm's Household Tales*.
 Recitations.
 Paper folding.
 Mosaic with coloured paper; use of gum.
 Drawing. Brush drawing.
 Plaiting paper.
 Ruling simple geometrical forms.
 Measuring length. Estimating length.
 Weighing. Estimating weight.
 Setting a table (carrying a glass of water without spilling it. Moving cups without breaking them).
 Modelling in clay.
 Basket work.
 Cutting out patterns and shapes with scissors.
 Word building.
 Number pictures, with cubes, beads, &c.

B.—What children between three and five years of age can do:—

Games with music.
 Games without music (guessing games, &c.).
 Recitations—nursery rhymes, &c.
 Picture lessons (learning to answer in complete sentences as to what they can see in a picture).
 Paper folding.
 Mosaic with coloured tablets.
 Drawing.

Matching colours (picking out the same shades of wool from a heap of remnants).

Plaiting paper.

Working patterns with needle and worsted.

Threading beads in twos, threes, &c.

Arranging shells in twos, threes, &c.

Arranging "pictures of number" with cubes.

Word building.

APPENDIX D.

Circular 332.

INSTRUCTION OF LOWER STANDARDS IN SCHOOLS FOR OLDER SCHOLARS.

Education Department, Whitehall,
January 6, 1894.

SIR,—A general opinion was expressed by the Chief Inspectors at their last conference that the condition of the lower part of many of the schools for older scholars is at present the weakest point of the instruction in public elementary schools.

In the best infant schools children are taught by natural methods, and are trained to use their powers of observation and reasoning; in schools for older scholars they are too often taught by arbitrary and conventional methods, and there is little in the general course of instruction to lead them to observe or to reason. Object lessons are in many cases discontinued, the reading lessons are encumbered with the teaching of spelling even in the 1st Standard, and hand and eye occupations are very rarely found. Arithmetic also often becomes a mere abstract or mechanical exercise, and is not made to rest upon simple questions of common life within the knowledge and observation of the scholars, nor is it always sufficiently an exercise in reasoning.

When the general character of the lesson presents so little opportunity for the cultivation of intelligence, it cannot be expected that the habit of a spontaneous desire to question which ought to be fostered in young scholars will arise; and it is to be feared that, when examined, they often reproduce knowledge which has been conveyed by methods which are not truly educational.

It should be borne in mind that object lessons cannot be dispensed with if habits of observation are to be duly fostered, and they should be treated as a means for mental exercise and not merely as opportunities for imparting miscellaneous information. Objects should always be present, and in sufficient numbers; and the chief aim should be to call into activity observation and the

construction of clear mental pictures, so that the intelligence of the pupils may be exercised and developed. Geography, where it is a class subject, should be treated in a similar way, and should be taught by visible illustrations and by actual modelling in sand and clay, for the production of miniature rivers, mountains, &c. Tales from History also, if graphically told and well illustrated by striking pictures of sufficient size, will be very helpful in the same direction. Elementary science (the schemes for which as given in Schedule H. of the Code prescribed object lessons solely for the 1st and 2nd Standards) is obviously an excellent class subject from this point of view.

But whatever may be the method followed, some system of lessons should be arranged in every school by which an intelligent habit of observation and simple reasoning may be fostered, while it cannot be too clearly pointed out that all the subjects simultaneously dealt with in a curriculum should be kept as closely interconnected and made as mutually helpful as possible, and not be unduly isolated and specialized.

So also as regards hand and eye training, it is much to be regretted that the ingenious and progressive kindergarten exercises for training scholars in deftness of hand and correctness of eye should be almost entirely discontinued after children leave the infant school; and the more so when it is remembered that the mind itself is most effectively trained by such exercises, whenever they are the expression of the children's own thought.

Drawing with coloured chalks, modelling in clay, embroidery of outlines, formation of geometrical patterns and models, and building with cubes, &c., have been tried with excellent results and at very small cost, as convenient methods of continuing the instruction given in the infant school.

You will be careful to explain to managers how very interesting, inexpensive, and educational all these methods are.

As regards the elementary subjects, spelling, unless founded upon methodical and well-graduated lessons on classes of words, should be absolutely discouraged in the lower classes; and in arithmetic, no sums should be set either in the 1st or 2nd Standard which the scholars themselves cannot either put down when set in a concrete form or translate into concrete qualities when set in abstract numbers.

The use of the reading-book for spelling lessons should also be discouraged. Otherwise the interest in the subject is lessened, and the time which should be devoted to intelligent conversation between the teacher and the class on the matter of the lesson is curtailed.

In connection with object lessons or other similar instruction, the practice of answering by complete sentences, which largely prevails in infant schools, should, whenever possible, take the place of elliptical or simultaneous answering.

Attention might be also usefully drawn to the desirability of employing, in these lower parts of schools for older scholars, women

teachers who have had experience of infant teaching, and, especially those who have been trained for kindergarten work.

It should never be forgotten that, unless the lessons themselves are made attractive to these young children by their simplicity of treatment, by the suitability and variety of the illustrations, and by association with their everyday life, the most carefully drawn curriculum, and the most thoughtful arrangement of time-tables will fail to attract the children of those parents, who set little value on the education of their children.

Their Lordships believe that there is nothing in the Code, or in the present system of examination, that need in the least degree prevent such simple and natural methods of teaching as have been described, and they would be glad to hear of anything that would remove any impediment, should such appear to exist. They desire also to point out that the general intelligence which these methods of instruction tend to foster is of the highest advantage in improving the teaching of other subjects of instruction which form part of the curriculum.—I have, &c.,

(Signed) G. W. KEKEWICH.

APPENDIX E.

Circular 369.

OBJECT TEACHING.

Education Department, Whitehall,
London, 25th June, 1895.

SIR,—It has been observed that in schools in which Object Teaching has been introduced with most success the teachers have carefully distinguished between two kinds of instruction which in other schools are not seldom confused. These two kinds of instruction are—(1) observation of the Object itself, and (2) giving information about the Object. This distinction is of importance, because the scope and method of the lesson differ according to its nature. Object Teaching leads the scholar to acquire knowledge by observation and experiment; and no instruction is properly so-called unless an Object is presented to the learner so that the addition to his knowledge may be made through the senses.

Junior teachers have not unfrequently given lessons before H.M. Inspectors which were wrongly described as Object Lessons because in dealing with the topic selected no suitable appeal was made to the eye of the scholar. A lesson, for example, on the elephant to children in village schools, who have no opportunity of visiting either Museums or Zoological Gardens, may convey information and store the memory with interesting facts, but it does not cultivate the habit of obtaining knowledge directly and at firsthand, or

develop the faculty of observation. However well the lesson may be illustrated by diagrams, pictures, models, or lantern slides, if the children have no opportunity of handling or watching the actual object which is being dealt with, the teacher will be giving an Information Lesson rather than an Object Lesson. It should be always remembered that in Object Lessons the imparting of information is secondary to the cultivation of the faculty of observation.

Object Teaching should further be distinguished from Instruction in Natural Science. It is Elementary Science only in so far as it aids the child to observe some of the facts of nature upon which Natural Science is founded; but as it deals with such topics without formal arrangement, it differs widely from the systematic study of a particular science. The principles of scientific classification, the continuous study of one group of natural phenomena, the generalization from facts, and the search for natural laws, belong to a later stage of mental discipline, which will be much more effectual if it is being based upon the preliminary training of the senses through sound Object Teaching. It is most important, therefore, that if, for example, Object Lessons are given on plant life, no attempt should be made to treat them as a continuous introduction to the study of Botany, or, if the lessons relate to animal life, to the study of Zoology. In Object Teaching the chief interest in the lesson should centre in the Object itself.

The following suggestions, which have been made by practical teachers, will be found useful:—

- (1) The teacher should select only so many of the Objects set forth in the appended or other similar lists as can be dealt with in the year without overburdening the scholars. Habits of observation are better cultivated by the thorough examination of a few objects than by the superficial treatment of many.

- (2) No Object should be chosen which the teacher cannot thoroughly illustrate either by the Object itself or by some adequate representation of the Object, or by both. All that is purely technical, whether in the mode of study or the language and terminology, should be carefully avoided.

- (3) The children should be encouraged to bring with them to the lesson illustrative specimens which they have collected or borrowed from friends.

- (4) The children should be encouraged to make simple drawings illustrative of their observations, wherever possible, and in certain cases to make simple records on square-ruled paper. Clay modelling and other manual occupations may be employed to test the accuracy of the impressions which the children form, and to fix them in their minds. Teachers also should frequently illustrate details of the lesson by black-board drawings. Children who are jaded in five minutes by a lecture will be open-eyed and receptive for half an hour while the teacher draws as well as talks.

- (5) Visits to Museums and other institutions of educational value are now recognized by the Code, and may advantageously be under-

taken where possible in connection with the Object Teaching. Occasional class excursions out of school hours (or, if the instruction be in accordance with Art. 12 (f) of the Code, in school hours), under proper guidance, will enable teachers both to provide suitable Objects and to confirm previous impressions. It should be borne in mind that Objects, when they are brought into the class-room, cannot be there studied under their ordinary conditions; and therefore it is important by a proper use of such expeditions to let the children see what part the Object plays in its usual surroundings.

(6) If the scholars are to learn intelligently from their Object Lessons, the first requisite is trained attention. The right method of securing this is to direct, in a conversational way, the attention of the children to the different parts of the object in an orderly manner, and explain the relation of each part to the whole. After the analysis or study of separate detail the object should be again treated as a whole. It should not be left in fragments, but the division into parts should be followed when possible by the reconstruction of them into their original unity. Through such teaching the vague and indefinite impressions which children receive from Objects when they are first presented to them are gradually converted into clear mental pictures.

(7) The attempt to teach children to be accurate in observation cannot be separated from the need of making them accurate in description. After the children have been trained to observe a fact they should be practised in making a correct statement of it in a sentence of their own. This oral answering in complete sentences will lead to correct use of the English language, both in talking and writing, and will store the mind with a useful vocabulary. In the higher standards the children will be able to write brief weekly compositions in which they may express in a written form the ideas which they have acquired through oral instruction.

To sum up the main value of Object Teaching, there are three principal uses. The first and most important is to teach the children to observe, compare, and contrast; the second is to impart information; and the third is to reinforce the other two by making the results of them the basis for instruction in Language, Drawing, Number, Modelling, and other Handwork.

There are, however, other important uses of good Object Teaching. It makes the lives of the children more happy and interesting by opening up an easily accessible and attractive field for the exercise of brain, hand, and eye. It gives the children an opportunity of learning the simplest natural facts, and directs their attention to external Objects, making their education less bookish. It further develops a love of nature and an interest in living things, and corrects the tendency which exists in many children to destructiveness and thoughtless unkindness to animals, and shows the ignorance and cruelty of such conduct. The value of the services which many animals render to man should be dwelt upon, and the importance of kindly treating them and preserving them should be pointed out.

By these means, and in other ways, good Object Teaching may lay the foundation for the right direction of the activity and intelligence of the children throughout the whole school.—I have the honour to be, Sir, your obedient servant,
G. W. KEETWICH.

OBJECT LESSONS.

The following lessons deal with the ordinary phenomena of common life and with objects familiar to the children. The teacher's choice is not confined to these lists; other objects will be accepted subject to the approval of the Inspector. Any of the objects may be dealt with at the discretion of the teacher in more than one lesson, and although they have been grouped for convenience of reference, it is not intended to prescribe any specified number of them for a yearly course. With different treatment the same object may be adapted to more than one standard. Some teachers may prefer to deal with the same object in successive years, or to recur to it after a year's interval, expanding the study to suit the growing powers of the scholars. To meet the varying requirements of teachers it will be noticed that in some cases the names of the objects have been merely enumerated, while in other cases a few suggestions have been added as to the mode of treatment.

I. PLANT LIFE.

(a) *The Study of Plants as Growing Things.*

Grow an onion in a bottle of water, and note appearance of root and stem. Make a model in clay of the various stages of growth at short intervals.

Grow mustard seed on damp flannel, and note stages of growth.

Notice a few curious roots.

The carrot. Cut off the top of one, and grow it in a saucer of water.

Contrast the root of a daisy (fibrous).

Roots which walk. Strawberry or strawberry.

Violet root.

Contrast root of Iris and Solomon's Seal in their modes of extension.

Stem. Count the rings in a trunk that has been felled. Rings, how produced; estimate age of tree; the record of wet or dry seasons.

Climbing stems. Ivy.

Train bindweed up a stick, and note that it turns to the right. If you unwind it and force it the other way (to the left) note how it resumes its old direction again, holding the stick with one of its leaf-stalks to get a purchase for the change.

Simple experiments to show effect of light on (1) leaves, and (2) roots. Celery; blanching.

Leaves of deciduous trees contrasted with leaves of evergreens. Contrast leaves of holly, ivy, and box with leaves of oak, elm, and beech.

Note autumn tints. Collect and press leaves of various colours in autumn.

Buds. Leaf buds and flower buds.

Parts of a flower.

Fruits. Different kinds.

(b) *Blossoms, Fruits, Seeds, and Leaves.*

Parts of a flower.

Flowers of curious shape.

Pea blossom.

Insects and flowers.

Colours of flowers and insects.

Fruits. How seeds are scattered.

Shooting seeds.

Flying seeds.

Curious flowers, *e.g.* primrose, compound flower (daisy); water lily.

Leaves. Shape, veining, arrangement.

Flowers as supplying (1) weather-glass, (2) clock, (3) calendar.

Examine celery plant. Cut leaf-stalks into thin sections to see how a plant is built up.

(c) *How Plants are Adapted to their Surroundings.*

A bunch of spring flowers (according to time of year).

A bunch of summer flowers " " "

A bunch of autumn flowers " " "

Flowers and the soil. Bog plants.

Riverside plants.

Plants that grow in running water.

Plants that grow in still water.

Meadow plants.

Plants of the heath and moor.

Plants of the hills. Plants of the wood. Plants of the sea-coast and salt marshes.

Sundew and flesh-eating plants.

Ferns.

The spores of ferns.

Grow some spores in a pan under glass, and watch growth and development of a fern. Contrast with growth of mustard from seed.

Mosses.

Lichens.

Funguses.

Simple experiments in manuring plants.

How plants help or hinder each other's growth

Parasites. Mistletoe.

Plants which help or injure man.

II. ANIMAL LIFE.

(a)

The Cat (Compare with Dog).—Eyes, rough dry tongue, soft pads and sharp claws, teeth, method of holding prey, drinking, covering of fur, whiskers, tail.

The Cow (compare with Sheep and Goat).—How she takes her food, teeth, chewing, milk (cheese and butter), tail, hoofs, covering, ears, horns, nose.

The Horse (compare with Donkey).—Covering, teeth, hoofs, tail, mane.

The Rabbit (compare with Hare).—Teeth, legs, feet, claws, covering, tail, whiskers, ears, eyes.

The Mouse (compare with Rat and Water Rat).—Teeth, paws, tail, whiskers, eyes, ears.

A Fish.—How fitted to live in water, weight, shape, covering, temperature, movements.

A Plaice (compare with Herring).—Flat, eyes on one side of head, gills, movements.

Animals which sleep in winter.—Examples: squirrel, dormouse, common snake, frog, toad, snail, slug. Preparation made for sleep.

(b)

Mole.—Shape, snout, teeth, paws, claws, eyes, ears, fur, food.

Hedgehog.—Covering of spines, how it rolls itself into a ball and why, head, teeth, food.

Common Snake (compare with Viper).—Shape, covering, teeth, how it moves, how it swallows its prey.

Frog (compare with Toad and Newt).—Movement, capture of prey, breathing, winter quarters.

Garden Snail (compare with Slug).—Shell, mantle, head, horns, eyes, food, preparation for winter sleep.

Earth Worm.—Shape, rings, locomotion, food, usefulness.

Spider (contrast with Bee).—Shape, segments, legs, eyes, jaws, spinnerets, web, breathing organs.

(c)

Paws and Claws and their uses.—Cat, dog, rabbit, mouse, mole, frog.

Tails and their uses.—Horse, cow, donkey, dog, cat, monkeys, harvest mouse.

Tongues and their uses.—Cat, dog, cow, woodpecker, frog.

Teeth and their uses.—Man, cat, cow, horse, rabbit, snake, fangs of poisonous snakes.

Hair, Fur, Wool, and their uses.—Cat, mole, dog, sheep, fox.

Beaks of Birds and their uses.—Duck, fowl, parrot, sparrow, goat-sucker, heron.

Feet of Birds and their uses.—Duck, fowl, swift, owl, &c.

Insects.—Examples: bee, beetle, butterfly, cockroach, silkworm. Insect development, legs, wings, segments, mouth, breathing apparatus, ovipositors.

III. THE SKY, THE AIR, THE SURFACE OF THE LAND, AND WATER.

(a) *The Sky.*

Sunrise, noon, and sunset. (Note the object over which the sun is seen to rise from month to month. Note sun's position at noon, and its varying height above horizon.)

Shadow. (Note by aid of a spike erect on a flat disc the varying length of the shadow at noon. Study the shadows of objects. Variation in sharpness and depth.)

Moon. (Note the changes. Draw the shape from week to week.)

A few of the brightest constellations. (Make diagrams on square-ruled paper from a study of the sky itself. Great Bear and Pole Star; Lyre and Vega; Cassiopeia.)

Planets. (Note any planet visible when the lesson is given. Mark its position on square-ruled paper for a few weeks.)

Varying length of day and night.

(b) The Air.

Wind. Varying direction. (Note and keep record of the direction of the wind from day to day.)

Warmer and colder winds; rainy and dry winds.

Moisture in the air shown by sea-weed; string (changing tension).

Wet cloth dries in the wind (water turns to vapour).

Vapour turns to water. (Breathing on slate. Clouds on hills. Evening mists.)

Clouds in the sky. Three chief kinds: "heaps", "beds", "feathers".

Rain. (Note size of drops. Raindrops on dust form little balls. Note effect of heavy rain in tearing up roads. Note the channels so made, and the arrangement of the sand and pebbles washed to a distance.)

Rainbow. (Note the succession of colours. Note position of sun behind observer and of the bows where the shower of rain is falling. Note that height of arch changes. When is it higher and when lower?)

Rainbow colours on shells, film of tar, &c. Feathers of birds.

Dew. (Note when formed. Cloudless weather. On what does it lie thickest?)

Hoar frost.

Snow. (Note size of flakes. Movement of flakes in the air as they fall. Snowdrift. Snow squeezed into ice.)

Hail. (Note when it falls. Examine hailstones. Is the hail accompanied by thunder?)

Thunder and lightning.

(c) The Surface of the Land.

Level or sloping. Simple way of measuring slope. Height of school and neighbouring hilltops above sea-level.

Flow of water over the land. Neighbouring stream or streams. Water-partings.

The river basin in which the school is situated.

Construct a model fountain, and make simple observations on the pressure of water. Milldam. A "head" of water. Notion of falling water as a motor.

Soils. Clay, sand, slate, granite, chalk, quarries near school, gravel-pits, clay-pits, brick-works. (Note how the rocks lie, in layers or in masses without structure.)

Stones in the brook, water worn; pebbles on beach, rounded; pebbles in gravel-pit often with sharp edges, perhaps iceborne.

Difference between sand and mud. Crumbling rocks. Effect of frost on damp rocks.

Caves by the sea formed by the waves; caves inland formed by rain dissolving limestone; stalactites. (A lesson for schools in limestone regions or near rocky coasts.)

Building-stone, marble, slate, Bath-stone, sandstone, &c.

In marble, note shells, &c. Note plants in coal.

Volcanic rocks. Lava, brimstone, pumice-stone, basalt or whinstone. (According to the nature of the district.)

Rock salt; crystals of salt. Salt in sea-water. Mineral in solution.

Hard and soft water. Rain-water compared with streams from chalk or limestone; leavings after evaporation. Fur in kettles. Softening hard water.

(In certain districts) other minerals in solution, sulphur wells, iron springs, medicinal waters.

Mortar and cement. (Slake lime and make mortar; note the heat, &c.)

Surface soils. Crumbled rocks. Waterborne sand and mud. Vegetable mould and earthworms.

Vegetation and cultivation. Forest, moor, and heath. Heathers.

Hedgerow trees—elms, ashes.

Trees of the forest—oak, beech, birch.

Evergreen trees—pines and firs.

Evergreen plants and shrubs—holly, ivy, box. Contrast evergreen and deciduous leaves. (Note changes at fall of leaf. Autumn tints. Press specimens.)

Riverside trees—willows, poplars, aspens.

Hill pasture and meadows. Turf on the downs and hay in the valleys.

Gardens and their contents. Garden fruits and wild fruits. Garden flowers and wild flowers.

(d) *Water.*

Standing water; ponds; pond life.

Springs and running water. Clear water looks shallower than it is. Simple experiments in illustration.

Study of flow of a stream. Where the flow is quicker (a) in the middle; (b) on one side, outer and inner bend. Where the bank is eaten away and where sand is spread out. Varying bottom; deep pools, shallows, sand banks. Confluence of tributary. Delta. Measure the speed at which the water flows.

Study of sea-shore. Rocky and sandy coasts. Soundings. The rise and fall of the tide. Currents. Drifting sand. Effect of frost on cliffs. Breakwaters. Layers of soil and rock exposed down the side of a cliff.

Measure with thermometer the temperature of (a) a spring; (b) a stream; (c) a pond; (d) the sea.

Ice. Study hardness, mode of fracture; splitting blocks with a needle. Does it sink or swim in water? Easy to make two surfaces of ice freeze together. Simple experiments with ice.

Watch and record behaviour of thermometer plunged in melting ice.

Melt some ice carefully to find out whether it takes up more or less room than the water into which it changes. (Force a mass of ice into a lump of clay and let it melt there.)

Freeze some water in a bottle and note bursting of bottle. Bursting of pipes.

Notes on expansion and contraction of substances illustrated by behaviour of water at different temperatures. Preliminary notion of thermometer.

Watch cold spring water being heated to boiling point in transparent glass vessel. Note bubbles of air given off, and as the water is heated bubbles of steam rising from below. Observe force of compressed steam. Preliminary notion of steam-engine.

Dribble powdered alum into clear water. Hang thread in the solution and note the formation of crystal. Alum and other crystals.

Expose to the air crystals of (1) salt; (2) soda. Note change. What difference? What difference according to weather? Expose to the air crystals of saltpetre, and note result.

Dribble salt into clear water and note that it dissolves, quicker at first, then slower, at last no more is dissolved. Place a fresh egg in saturated solution and afterwards transfer it to clear water.

One liquid is denser than another. Compare water and mercury. Things which float in mercury and sink in water.

Upward pressure of water on bodies dropped into it. Why bodies sink or float. Why steel ships float. Why cork floats.

Simple experiments in displacement of water.

Simple experiments in pressure of water and pressure of air. Siphon. Squirt. Pump. Diving-bell.

Distillation of water. Filtration.

Water; a combination of two gases, oxygen and hydrogen. Simple experiments.

IV. OBJECT LESSONS FOR TOWN SCHOOLS.

(a.)

The water we drink—how obtained. Some of the simpler properties of water.

River (or canal)—according to circumstances.

Boats, barges, or ships, with which children are familiar—according to circumstances.

Other ships, *e.g.* Atlantic liners.

Bricks—their size, shape, and manufacture; their size, &c., to be ascertained by children's measurements.

Bricklayer's work—arrangement of bricks in 14-inch wall and in 9-inch wall, shown with real bricks, or with small wooden ones; mortar, &c.

Coal—its simpler properties.

Coal—how obtained.

Coal—how transported and how used.

Coal-gas; it may be made in presence of the children.

Gas-works and gas-pipes.

Petroleum—how obtained; its simpler properties and uses.

Lamps and their dangers.

Common stones used in building and road-making.

Road-making and paving.

Quarries and quarrymen.

Railways—general sketch.

Engines and carriages.

The work of railway men.

The park or public garden—general sketch.

The park or public garden—one or two of its more conspicuous trees.

The park or public garden—one or two of its more conspicuous plants.

Comparison between calico and flannel.

Cotton and its manufacture.

Lancashire and the cotton district; mills.

Sheep-clipping and rearing.

The West Riding of Yorkshire; factories, &c.

(b.)

Cart-horse.

Donkey.

Sparrow.

Rat or mouse.

Cat.

Plants grown in schoolroom (acorn in glass of water).

Plants grown in schoolroom (mustard and cress).

Plants grown in schoolroom (hyacinth in water or pot).

Plants grown in schoolroom (a fern).

The sweep and his work.

Costermonger and what he sells.

Some common fruits sold in streets or shops, *e.g.* pears and apples.

Some common fruits sold in streets or shops, *e.g.* strawberries.

Some common fruits sold in streets or shops, *e.g.* oranges.

Some common fruits sold in streets or shops, *e.g.* cocoanuts.

Things seen in grocer's window, *e.g.* tea.

Things seen in grocer's window, <i>e.g.</i> sugar.	The addressing and posting of a letter.
Things seen in grocer's window, <i>e.g.</i> coffee.	The postman and the post-office. Dangers from fire and how they may be avoided.
Things seen in grocer's window, <i>e.g.</i> currants and raisins.	The fireman and the fire-engines.
The baker and his work.	'Bus or tram drives.
The milkman.	The policeman.

V. OBJECT LESSONS FOR COUNTRY SCHOOLS.

(a.)

The farmyard. Its buildings and their contents. Animals kept on a farm and their uses. Necessity of cleanliness, kindness, and suitable food. The dairy and its contents. Butter and cheese making.

Bees. Bee-keeping.

Spring. Spring flowers. Work in the fields in spring. The cuckoo and swallow. Record date of arrival.

Summer. Different kinds of leaves and fruit. Work in the fields in summer.

Autumn. Work in the fields.

A mill and the work of a miller.

Winter. Frost. Ice. Snow.

Birds. Singing birds, as the thrush and nightingale. Birds of prey, as the hawk. Swimming and wading birds, as the duck and heron.

Wild Animals. The fox, hare, and rabbit.

Minerals. A mine. Three useful minerals.

The lessons on the seasons should correspond with the actual seasons of the year, and the different operations explained should be taken while each is in progress.

Leaves of trees may be dried by simply placing them between sheets of paper and pressing them. Their shapes may be used for the children to draw round on paper, which can afterwards be pricked and then sewn round.

(b.)

Springtime.	{	The waking of Nature.
		The lengthening daylight in the morning and evening, the coming warm weather, birds singing, building their nests, laying their eggs, the trees and hedges changing, buds and leaves, the bloom on fruit-trees.

The local wild flowers of spring. The daisy, primrose, bluebell.

Summertime.

The local wild flowers of summer.

Autumn.

The local wild flowers of autumn.

Winter. The repose of Nature.

The land. Woodland, meadowland, ploughland, moorland.

The sky.

A bird—covering, wings, beak, feet; motion; nests, eggs, food.

Local birds.	{	Thrush or blackbird.
		Lark.
		Robin.
		Rooks.

Birds which come for the summer.

Birds which come for the winter.

Local wild animals. $\left\{ \begin{array}{l} \text{Rabbit.} \\ \text{Hare.} \\ \text{Fox.} \\ \text{Hedgehog.} \end{array} \right.$

Animals on a farm.

Our village.

The carrier's cart.

The cottage garden.

The stream or river, its banks, the birds and animals that live near it.

A fish.

A plant.

(c.)

The garden in spring.

The farm in spring.

The garden in summer.

The farm in summer.

The garden in autumn.

The farm in autumn.

The garden in winter.

The farm in winter.

The weather and wind.

The soil; sunshine, air, rain, frost, manure.

The farmer's tools. The plough, drill, reaping-machine.

The crops; grass, corn, root-crops.

Wheat.

The potato.

The oak-tree.

The elm-tree.

The apple-tree.

Evergreen trees.

An insect.

The spider and his web.

The butterfly; colours, beauty, history.

Bees.

The farmer's pests.

The farmer's friends.

A pond.

A frog.

A ramble in a wood and what may be seen there.

The railway.

Market-day in the neighbouring town.

A newspaper.

VI. OBJECT LESSONS IN THE SCIENCE OF COMMON THINGS.

(a.)

Water.—How carried, jugs, bottles, barrels, spouts, funnels. Wells. Things that float, things that sink.

Solids.—Hard and soft, in the room and in clothing. Files. Hammer and nails. Buttons.

Powders.—Flour.

Pastes.—Paste, clay, putty.
 Things porous.—Bread, sponge.
 Things that melt.—Butter, tallow, sealing-wax. Ice, snow.
 Water.—Drying clothes, breathing on slates, frost on the pane. The boiling of the kettle. The pot boiling over.
 Things that dissolve.—Sugar, salt.
 Air.—Bubbles, pouring water through funnel into empty bottle. A burning candle. Fans, blowing feathers. Paper windmills.
 Forms of strength.—The floor, joists and boards. Wooden bridges.
 Steps and stairs.
 Things that stretch.—Elastic bands.
 Things that bend.—Bow and arrows. Cord, ropes.
 Machines.—Tops. Roller for pastry, for garden. Perambulator.
 Movements.—Walking, running, leaping, creeping, crawling.
 Musical toys.—Harmonicon. Bell.

(b.)

Water.—Pipes, taps, the fountain. Canals. Rafts, boats, anchors.
 Solids.—Teeth, nails and claws. Sand-paper. Pins, needles, awl, gimlet. Hook and eye.
 Powders.—Chalk, pencil.
 Pastes.—Mud in streets, brickmaking.
 Things porous.—Brick, chalk, springs of water.
 Things that melt.—Candle-making. Icicles.
 Water.—Manufacture of salt from brine. Rain-drops, hail, spray, water-dust, the cloud.
 Things that dissolve.—The manufacture of sugar.
 Air.—The chimney, draughts. Waves and breakers. Winged seeds.
 Shuttlecock, arrow and kite.
 Forms of strength.—The ceiling. The arch. Ladders.
 Things that stretch.—A football.
 Things that bend.—Cart springs. Paper clips. Spider's web.
 Machines.—Hoop, fly-wheel of sewing-machine. Mangle. Waggon.
 Bicycle.
 Movements.—Swimming.
 Musical toys.—Musical box. Drum.

(c.)

Water.—Syphon, pump. Oil, cream.
 Solids.—Hinges, tires, and axles. The grindstone. Screws and screw-drivers.
 Powders.—Black-lead.
 Pastes.—Pottery.
 Things porous.—Blotting-paper, towels, wicks, earth.
 Things that melt.—Lead, iron.
 Water.—Salt lakes. Distillation of water. Clouds and rain.
 Things that dissolve.—Crystals, hard water, varnishes.
 Air.—The pop-gun, the fire-engine. Winds. A sailing ship.
 Forms of strength.—The roof. Railway bridges. Cranes.
 Things that bend.—Clock spring. Chains.
 Machines.—The loom. Threshing-machine. Rolling iron rails. Coining.
 Movements.—Flying.
 Musical toys.—Tin whistle. Sounds from stretched cord.

VII. MEASURING, WEIGHING, AND TESTING.

A two-foot rule.

Measurements of length—first by eye, then with rule.

Easy measurements of a square—first by eye, then with rule. } Measurements in inches only.

Easy measurements of rectangles.

The wire-gauge.

Callipers.

Scales and weights.

Weighing of common objects—first by hand, then with scales, weight in ounces only.

Weighing letters.

- **Plumb-line.**

Spirit-level.

Steam—observations on boiling water: condensation of steam, &c.

Mercury—weight of; *cf.* drop of mercury and drop of water; effect of heat on mercury.

Alcohol—effect of heat on it; its evaporation.

Thermometer, its manufacture.

Thermometer—uses; readings in ice, in boiling water, under the tongue, in schoolroom.

A candle—its composition. The wick.

Candle under bell-jar over water: candle in narrow-necked bottle.

Chalk—where found; its origin.

Chalk—its treatment with acid.

Chalk—its reduction to quicklime with blow-pipe: lime-water.

Sugar heated in test-tube; wood heated in test-tube.

Sulphur heated in test-tube; lead heated in test-tube.

Magnet and iron filings.

The compass.

APPENDIX F.

WORD-BUILDING AND SPELLING.

Circular 375.

(ISSUED BY EDUCATION DEPARTMENT TO H. M. INSPECTORS,
JANUARY, 1896.)

There appears to be some ambiguity as to what may fairly be required of young children in an examination on Word-building, and also at what stages and to what extent it is advisable to teach the spelling of anomalous words as a necessary addition to a series of lessons on Word-building with normal words.

Word-building is a system of teaching by means of a course of progressive lessons, leading up from the formation of simple sounds to the composition of words by means of affixes and suffixes, and may be considered to consist of two distinct divisions:—

1. The building up of a single syllable, by assigning to it that combination of letters which usage has determined to be the conventional representation of its sound, which is the true inductive method of teaching spelling.

2. The combination of one or more of such syllables, of which a root word (*i.e.* a word which cannot be reduced to a simpler form) is composed, with suffixes and affixes, such as the formation of nouns from adjectives, as *heavy*, *heaviness*; thus giving a training in the use of language.

The former process by itself would lead to correct spelling in the languages of countries which possess comparatively few cases of exceptional spelling. But the imperfections and inconsistencies of our English alphabet in representing many of the commonest sounds are so numerous that it might almost be said that in English we virtually possess two separate languages, a spoken language and a written language, the one appealing to the ear, the other to the eye.

It is not possible consequently to separate the spelling of anomalous words entirely from Word-building, because a purely phonetic method of spelling English words cannot be used; therefore, after dealing with a group of words connected by a common spelling of the same sound, and so reducing a considerable number of English words to certain visible and intelligible principles, the teaching should embrace the spelling of some few exceptional words of common use, which convey the same sound by a different combination of letters, though such instruction lies quite outside the progressive course of lessons on Word-building. It should be clearly understood that such lessons are subordinate to the Word-building, and should not be considered as a real test of a good series of Word-building lessons. In selecting the exceptions to be taught it would be wise to select such anomalous words as are in common use.

A clear distinction may be helpfully drawn between the methods of teaching groups of regular words formed by Word-building and exceptions to the rules. In teaching, the former should be spoken before they are written on the black-board, to connect more firmly the sound with its ordinary combination of letters; the latter should be written on the black-board before they are spoken, so that the teacher may be able to disconnect the same combination from its ordinary pronunciation.

The Word-building lessons in infant schools may be usefully restricted to the simple phonic teaching of the more common of the different sounds represented by the letters of the alphabet. It should be possible in infant schools to teach simple combinations which might include, for example, all the simpler closed syllables; while relegating to the schools for older scholars such difficult varieties of sound as are conveyed, for instance, by the three sounds of the combination 'ch' in *chin*, *charade*, and *chasm*. But the chief part of the Word-building will, in the upper schools, consist of the combination of root words with suffixes and affixes, which might be progressive in difficulty, rising from such simple forms as the more common terminations of nouns and adjectives and the suffixes denoting gender, to the formation of adverbs from adjectives or prepositions, or other difficult combinations. There is no better exercise of the inductive method of reasoning, nor one more intelligible and interesting to young children, than verbal analysis, *i.e.* the exact investigation of the several parts of familiar words. The addition, for example, of the suffixes *en*, *er*, *est*, *ly*, *ish*, and *ness* to the word *sweet*, and the use of words so found in short sentences, will lead the scholars by simple induction from these and other similar words to determine for themselves the exact meaning of each suffix.

Any course of Word-building proposed for your approval should be sanctioned if it follows the following rules:—

1. The classes of words proposed to be taught should be plainly set out, in progressive order, *i.e.* words that can be taught both through the eye and the ear.
2. The anomalous words, or words which form exceptions to these rules, which can be taught by the eye only, should be also set out in lists

submitted to the Inspector and limited to words in common use, and in any examination which you may hold no others should be expected to be spelt.

Some freedom may be permitted as regards different modes of spelling the same word, as inflexion and inflection, bylaw and byelaw, judgment and judgement.

APPENDIX G.

READING IN SCHOOLS.

Circular 407.

(ISSUED BY EDUCATION DEPARTMENT TO H.M. INSPECTORS,
DECEMBER, 1897.)

The teaching of reading aloud in elementary schools is so often unsatisfactory, that it seems desirable to invite the special attention of H.M. Inspectors to the subject.

The main object to be attained by the teaching of reading aloud seems to be the cultivation of, first, audibility of speech and, secondly, intelligent expression. Intelligent expression may be taken to mean such modulation of the voice as correctly interprets the meaning of a writer for a hearer. It is sometimes called shortly "intelligence", an abbreviation which has been at once the cause and the effect of a good deal of confused and futile teaching.

It is generally admitted that the reading in schools and the teaching of reading are unsatisfactory; nor are the reasons far to seek. They are, probably,

- (1) *The largeness of classes and the presence of many classes in one room.*—It is obviously impossible to give sufficient individual practice in classes consisting of forty, fifty, or of even a greater number of children; or any practice worthy of the name in the midst of confusion and clatter. The least of the evils for which this vicious organization affords an excuse are the generally harmful, because slovenly, practice of simultaneous reading, and the neglect of individuals, the commonest and the worst result is the cultivation of a slipshod indistinctness of utterance, and the production of a monotonous or sing-song intonation which is clearly recognizable as the effect of unison practice in a primary school.
And even in learning to recognize the printed symbol, the children of primary schools are slower than they would be if teachers did not frequently fall back on the device of the collective or simultaneous exercise, which encourages unthinking uniformity and represses individual effort.
- (2) *A premature and ill-judged regard for "expression";* and the consequent neglect of those mechanical parts of the reading exercise which are well within the range of the young pupil's power of achievement. Teachers are naturally anxious to impart a fluent modulation which shall indicate the comprehension of shades of thought and phrasing, and in pursuit of this complex and all but unattainable end they leave the attainable and simpler physical excellences unsecured. With ordinary care, children can be made to read with all due attention to the precise rendering of final consonants—of the highest importance in a language which throws its accents back and persistently slurs its final vowels—and can be made to produce their vowels *ore rotundo*. But to cultivate modulation and intonation by setting a short pattern to be imitated is to encourage a kind of hypocrisy that exposes itself in an unprepared passage at once and unmistakably.

Under most circumstances *short* "pattern reading" is of doubtful value, though special justification is claimed for it in those parts of the country where the popular speech is a droning monotone. If given by a teacher to children before they have themselves tried a passage, it discourages the effort to get naturally at the right rendering through a "first hand" comprehension of the meaning. When "pattern reading" is considered necessary, it is best to choose a passage which the class is *not*, on this occasion, about to read; and the passage worked out by the children under the direction of the teacher may be read aloud by the teacher, or by a bright pupil, at or towards the end of the lesson, serving a purpose like that of a "fair copy" of a written exercise or of a properly corrected and worked sum.

- (3) *Neglect to insist on careful articulation at all times.*—Many teachers reserve such attention as they bestow on articulation for the reading lesson, whereas it should be obvious that success in securing precision depends on the cultivation of a good habit of speech at all times. Truncated and "woolly" enunciation should be permitted in no circumstances; no answer to a question should be accepted from a child (unless he is conspicuously lacking in self-confidence) which is not clearly heard by every member of the class; and children should be encouraged to acquire the power of continuous audible speech by the exaction of reasonably long descriptions, *résumés* of lessons heard, and careful recitation. Nor is it necessary that in a reading lesson a book should lie open before every member of the class. Variation in procedure is valuable in every part of the school curriculum, but in the reading exercises perhaps more than any other. A practice full of profit to every member of a class (including the teacher) is to make each in turn read exclusively to the ears of his comrades, and not, as is usually the case, to their eyes alone.
- (4) *Confusion of an expository or information lesson with practice in reading aloud.*—Any lesson in which books are used may serve the purpose of "cultivating intelligence", and it is not the reading lesson alone that gives fit opportunities for varied illustrations. But teachers too commonly overload themselves in a reading lesson, with materials and information in order to make it interesting; and then try to communicate or evoke all sorts of knowledge, stopping occasionally by the way to hear the children read and to correct mistakes in the rendering. This is satisfactory neither to the teacher, whose resources it wastes, nor to the class, whose attention it weakens and dissipates. Teachers do best to divide reading lessons into two separate parts and to determine in what order these shall receive chief (not necessarily all) attention, according to the attainments of the class and the character of the passage to be read. Attention should be continuously given, at the one time, chiefly to the matter read, and at the other, chiefly to the manner of reading.

Children should not usually be asked to read a passage aloud until they have had sufficient time to master its general meaning by silent study. Until they have been allowed to do this, it is neither fair nor profitable, nor even reasonable, to expect them to read with "intelligence". It is a peculiar and marked defect of our common primary school practice to give the children so little at any time and in any subject to "get up" for themselves; they suffer from lack of what has been called "a little wholesome neglect"; the teacher too often tells or "elicits" all that they are expected to know. There is, therefore, too little intellectual activity, readiness, discursiveness, or originality, in some of the best of our schools; and, in consequence, there are too few signs, in reading aloud, of the individuality of expression which we call "intelligence".

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